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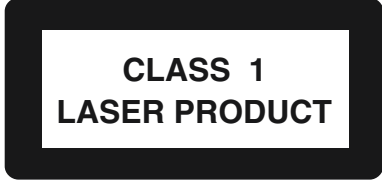


# Service Manual



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3140 785 32330

Version 1.0



# PHILIPS



**SPECIFICATIONS****GENERAL:**

Mains voltage : 110-127V/220-240V Switchable for /21M  
220-230V for /22/30/33/34  
Mains frequency : 50Hz  
50/60Hz for /21M  
Power consumption : < 35W Active  
< 15W at Standby with Clock on  
< 1W at ECO Standby /22  
Clock accuracy : < 4 seconds per day  
Dimension centre unit : 265 x 310 x 365mm

**TUNER:****FM**

Tuning range : 65.81-74.0MHz for /34  
87.5-108MHz for /21M/22/30/34  
Grid : 50kHz  
30kHz(switchable) for /34  
50kHz(switchable) for /34  
100kHz for /21M  
IF frequency : 10.7MHz  $\pm$  20kHz  
Aerial input : 75 $\Omega$  coaxial  
Sensitivity at 26dB S/N : < 22 $\mu$ V  
Selectivity at S9/300kHz bandwidth : > 25dB  
IF rejection : > 60dB [80dB]  
Image rejection : > 25dB [75dB]  
Distortion at RF=1mV, dev. 75kHz : < 3%  
-3dB Limiting point : < 23.5dBf  
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

**MW**

Tuning range : 531-1602kHz  
530-1700kHz for /21M  
Grid : 9kHz  
10kHz for /21  
IF frequency : 450kHz  $\pm$  1kHz  
Aerial input : Frame aerial  
Sensitivity at 26dB S/N : < 4.4mV/M [4.0mV/M]  
Selectivity at 18kHz bandwidth : > 18dB  
IF rejection : > 45dB  
Image rejection : > 28dB  
Distortion at RF=50mV, m=80% : < 5%

**AMPLIFIER:**

Output power : 2 x 20W <sup>1)</sup> RMS  
Frequency response  $\pm$ 3dB $\pm$ 5% : 60Hz-16kHz  
Dynamic Bass Boost : DBB Off, DBB 1, DBB 2, DBB 3 <sup>3)</sup>  
Digital Sound Control : Jazz, Techno, Optimal, Rock <sup>3)</sup>  
Headphone output, R<sub>LOAD</sub> = 32 $\Omega$  : 15mW  $\pm$  2dB  
Input sensitivity, R<sub>S</sub> = 600 $\Omega$   
Aux / CDR : 500mV / 1.0V  
Mic : {3.5mV}

**CASSETTE RECORDER:**

Number of track : 2 x 2 stereo  
Tape speed : 4.76 cm/sec +2.5/-1.5%  
Wow and flutter : < 0.4% DIN  
Fast-wind/rewind time C60 : 130 sec  
Bias system : 78kHz  $\pm$  10kHz  
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz  
Signal to noise ratio Type I : > 48dBA

**COMPACT DISC:**

Measurement done at output conn. of the CDC module.  
Frequency response within  $\pm$  1.5dB: 20Hz - 20kHz  
Output level (in Vrms) : 500mV  $\pm$  1dB, R<sub>out</sub> = 100 $\Omega$   
Signal/Noise ratio (A-weighted) : > 80dBA  
Distortion at 1kHz : < 0.003%  
Channel unbalance at 1kHz :  $\pm$ 1dB  
Channel separation at 1kHz : > 70dB  
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

{...} Values for /21M/33 only

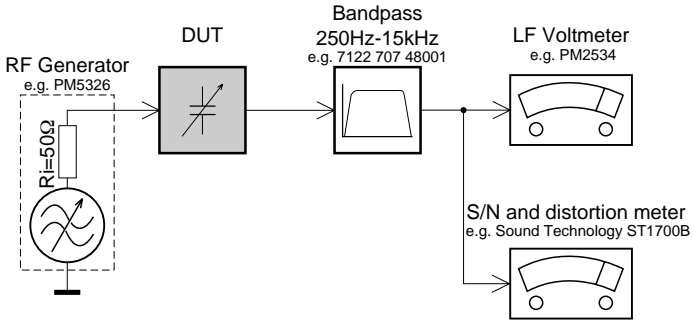
[...] Values for Cenelec Tuner only

<sup>1)</sup> 6 $\Omega$ , 1kHz, 10% THD

<sup>2)</sup> Frequency response in each setting is software controlled.

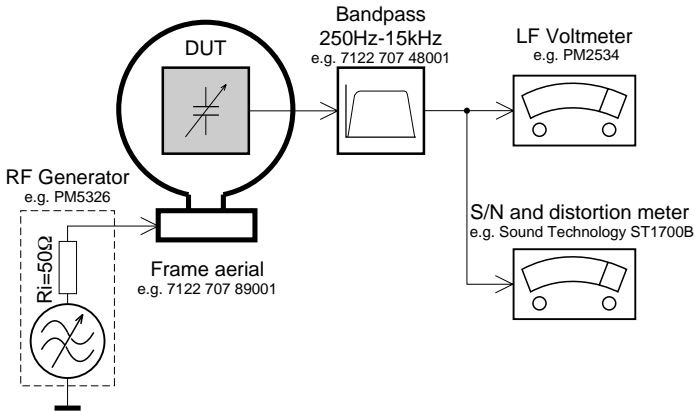
# MEASUREMENT SETUP

## Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

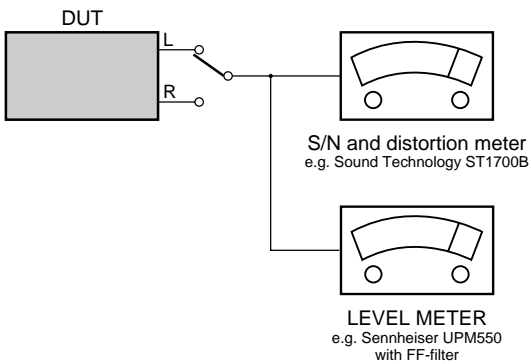
## Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.  
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

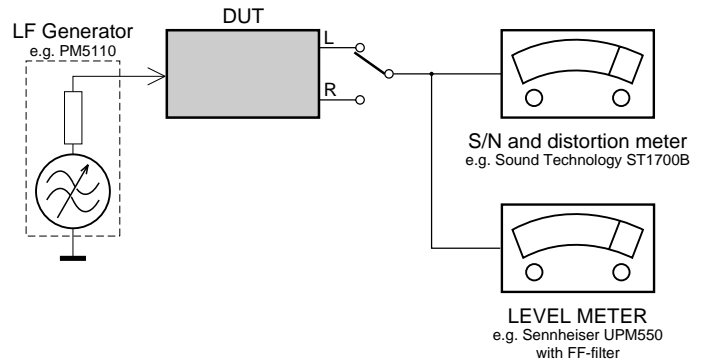
## CD

Use Audio Signal Disc SBC429 4822 397 30184  
(replaces test disc 3)



## Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069  
or Universal Test Cassette **Fe** SBC420 4822 397 30071





## SERVICE AIDS

### Service Tools:

Universal Torx driver holder .....	4822 395 91019
Torx bit T10 150mm .....	4822 395 50456
Torx driver set T6 - T20 .....	4822 395 50145
Torx driver T10 extended .....	4822 395 50423

### Cassette:

SBC419 Test cassette CrO2 .....	4822 397 30069
SBC420 Test cassette Fe .....	4822 397 30071
MTT150 Dolby level 200nWb/M .....	4822 397 30271

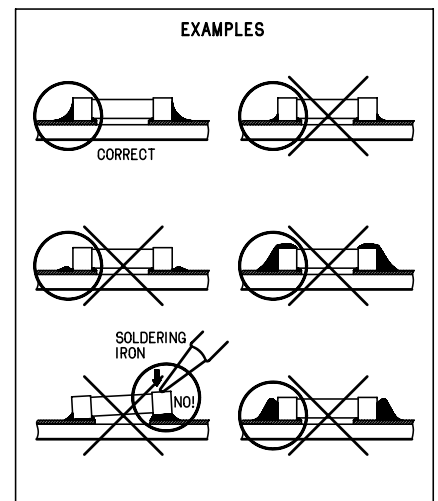
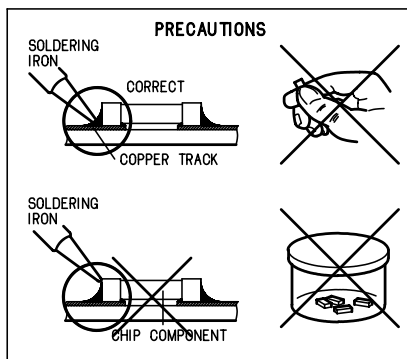
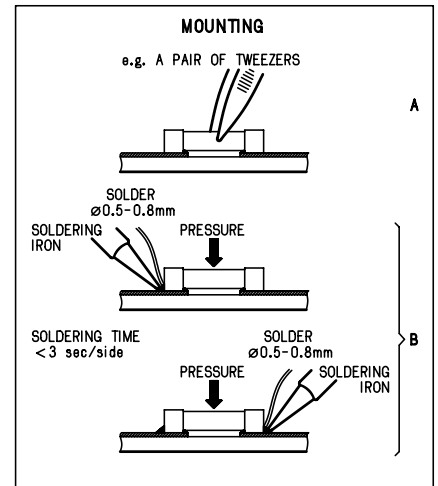
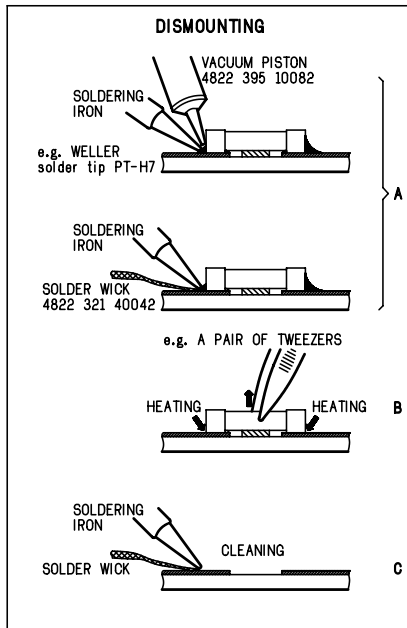
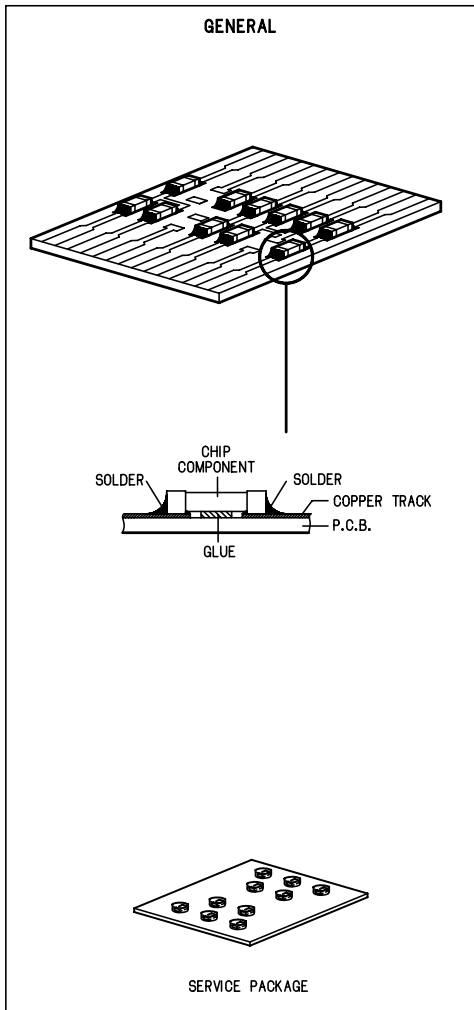
### Compact Disc:

SBC426/426A Test disc 5 + 5A .....	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz .....	4822 397 30155
SBC429 Audio Signals disc .....	4822 397 30184
Dolby Pro-logic Test Disc .....	4822 395 10216

### ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm ...	4822 466 10953
Anti-static table mat - small 600x650x1.25mm .....	4822 466 10958
Anti-static wristband .....	4822 395 10223
Connector box (1MΩ) .....	4822 320 11307
Extension cable (to connect wristband to conn. box) .....	4822 320 11305
Connecting cable (to connect table mat to conn. box) .....	4822 320 11306
Earth cable (to connect product to mat or box) ....	4822 320 11308
Complete kit ESD3 (combining all above products) .....	4822 320 10671
Wristband tester .....	4822 344 13999

## HANDLING CHIP COMPONENTS



**(GB) WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.

Keep components and tools also at this potential.

**ESD****(NL) WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.

Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op hetzelfde potentiaal.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).

Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le bracelet serti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**(D) WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**(I) AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridotta in caso di non osservazione della più grande cauzione alla loro manipolazione.

Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.

Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**(GB)**

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

**(NL)**

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

**(F)**

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

**(GB) Warning !**

Invisible laser radiation when open.  
Avoid direct exposure to beam.

**(S) Varning !**

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

**(SF) Varoitus !**

Avatussa laitteessa ja suojauslaitteiden ohitettaessa olet alltiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

**(D)**

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

**(I)**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

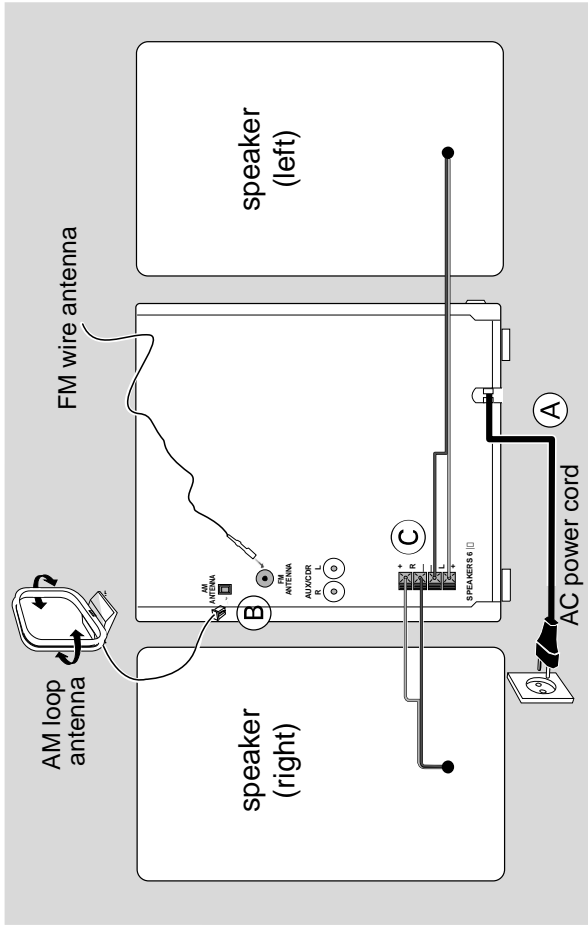
**(DK) Advarse !**

Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for strålning.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

# PREPARATIONS AND CONTROLS

## Preparations



### Rear connections

The type plate is located at the rear of the system.  
For users in the U.K.: please follow the instructions on page 1-9.

#### (A) Power

Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.

#### WARNING!

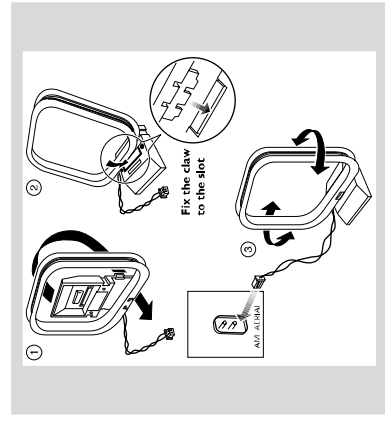
- For optimal performance, use only the original power cable.
- Never make or change any connections with the power switched on.

To avoid overheating of the system, a safety circuit has been built in. Therefore, your system may switch to Standby mode automatically under extreme conditions. If this happens, let the system cool down before reusing it (not available for all versions).

#### (B) Antennas Connection

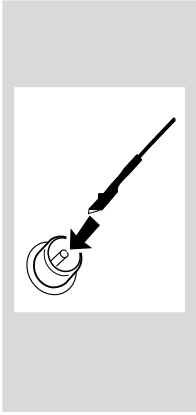
Connect the supplied AM loop antenna and FM antenna to the respective terminals. Adjust the position of the antenna for optimal reception.

#### AMAntenna



Position the antenna as far as possible from a TV, VCR or other radiation source.

#### FM Antenna

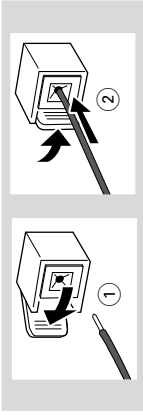


For better FM stereo reception, connect an outdoor FM antenna to the FM ANTENNA terminal.

#### (C) Speakers Connection

##### Front Speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "R" and left speaker to "L", coloured (marked) wire to "+" and black (unmarked) wire to "-".



Fully insert the stripped portion of the speaker wire into the terminal as shown.

#### Notes:

- For optimal sound performance, use the supplied speakers.
- Do not connect more than one speaker to any one pair of + / - speaker terminals.
- Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

## Preparations

### Optional connection

The optional equipment and connecting cords are not supplied. Refer to the operating instructions of the connected equipment for details.

### Connecting other equipment to your system

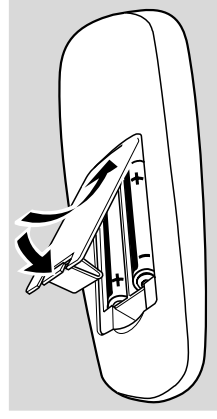
Use a cinch cable to connect **AUX/CDR IN** to the analogue audio out terminals of an external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder).

#### Note:

- If you are connecting equipment with a mono output (a single audio out terminal), connect it to the AUX/CDR IN left terminal. Alternatively, you can use a "single to double" cinch cable (the output sound still remain mono).

### Inserting batteries into the remote control

Insert two batteries type R03 or AAA (not supplied) into the remote control with the correct polarity as indicated by the "+" and "-" symbols inside the battery compartment.



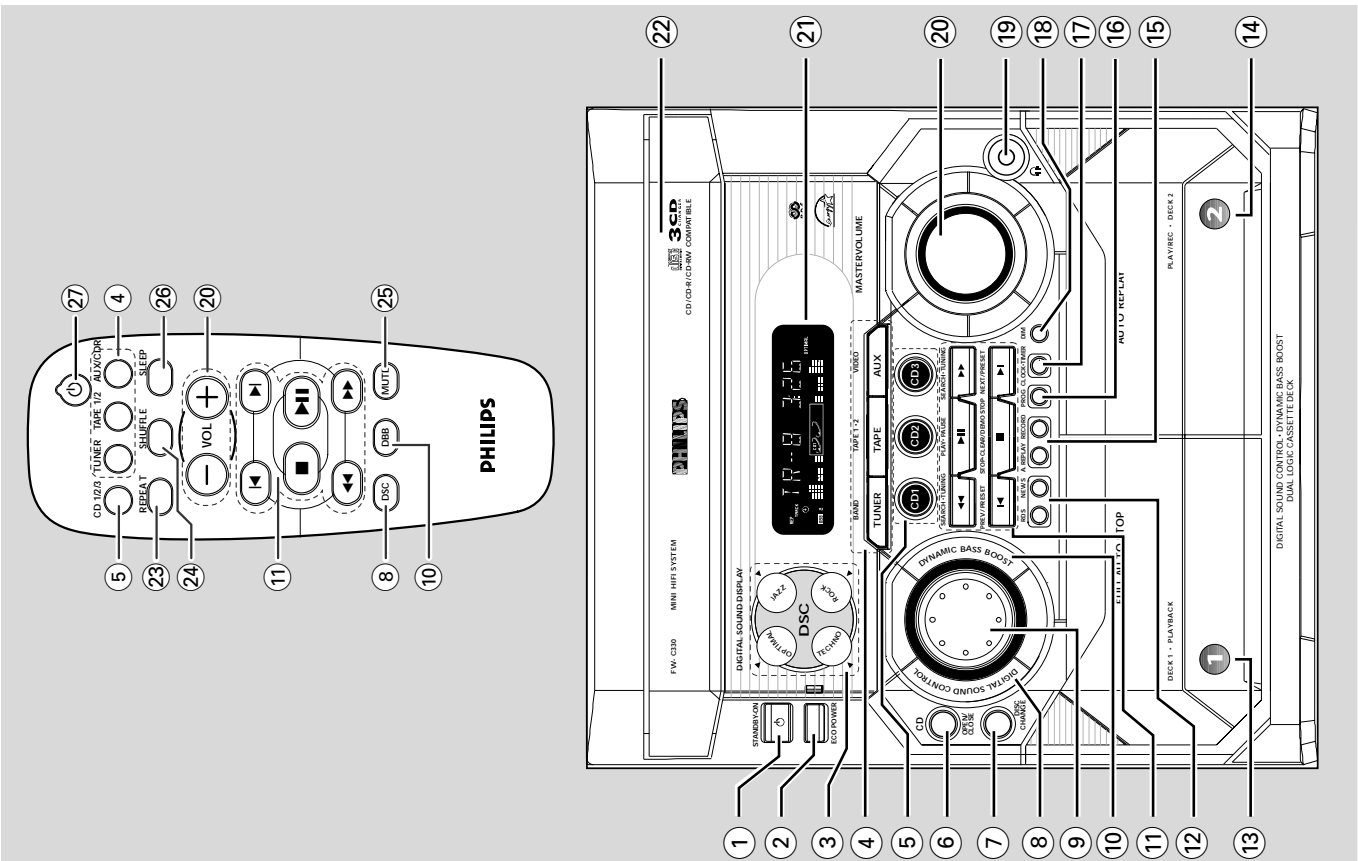
#### CAUTION!

- Remove batteries if they are exhausted or will not be used for a long time.
- Do not use old and new or different types of batteries in combination.
- Batteries contain chemical substances, so they should be disposed off properly.

# PREPARATIONS AND CONTROLS

## Controls

- 11 Mode Selection**  
**PLAY•PAUSE ▶ II**  
 for CD ..... to start or interrupt playback.  
 for Tape ..... to start playback.  
 for Plug & Play... (on the system only) to initiate and start plug & play mode.
- SEARCH•TUNING ◀◀ ▶▶**  
 for CD ..... to search backward/forward.  
 for Tuner ..... to tune to a lower or higher radio frequency.  
 for Tape ..... to rewind or fast forward.  
 for Clock ..... (on the system only) to set the hour.
- STOP•CLEAR / DEMO STOP ■**  
 for CD ..... to stop playback or to clear a programme.  
 for Tuner ..... (on the system only) to stop programming or to erase a selected preset.  
 for Tape ..... to stop playback or recording.  
 for Demo ..... (on the system only) to activate/deactivate the demonstration.  
 for Clock ..... (on the system only) to exit clock setting or cancel timer.
- for Plug & Play... (on the system only) to exit plug & play mode.
- PREV ◀ / PRESET ▼**  
**NEXT ▶ / PRESET ▲**  
 for CD ..... to skip to the beginning of the current, previous, or next track.  
 for Tuner ..... to select a preset radio station.  
 for Clock ..... (on the system only) to set the minute.
- 12 RDS**  
 - to select RDS information.  
**NEWS**  
 - to hear News automatically.
- 13 Tape deck 1**  
**14 Tape deck 2**
- Controls on the system and remote control**
- 1 STANDBY ON** ◻  
 - to switch the system on or to standby mode.
- 2 ECO POWER**  
 - to switch the system on or to Eco Power standby mode.
- 3 DIGITAL SOUND DISPLAY**  
 - the active DSC will be lighted.
- 4 TUNER (BAND)**  
 - to select waveband : FM or MW.
- TAPE (TAPE 1•2)**  
 - to select tape deck 1 or 2.
- AUX (VIDEO) (AUX/CDR)**  
 - to select the input for an additional appliance.
- 5 CD 1 / CD 2 / CD 3 (CD 1/2/3)**  
 - to select disc tray 1, 2 or 3.
- 6 OPEN/CLOSE**  
 - to open or close the disc tray.
- 7 DISC CHANGE**  
 - to change disc(s).
- 8 DIGITAL SOUND CONTROL (DSC)**  
 - to activate the jog control for DSC selection.
- 9 Jog control**  
 - to select the desired sound effect for the selected sound feature.  
 DSC .....JAZZ, ROCK, TECHNO or OPTIMAL  
 DBB .....DBB 1, DBB 2, DBB 3 or DBB OFF.
- 10 DYNAMIC BASS BOOST (DBB)**  
 - to activate the jog control for DBB selection.



## PREPARATIONS AND CONTROLS

### Controls

#### 15 Tape deck operation

##### A. REPLAY

- to select continuous playback in either AUTO REPLAY or ONCE mode only

##### RECORD

- to start recording on tape deck 2.

#### 16 PROG

- for CD ..... to programme disc tracks.
- for Tuner ..... to programme preset radio stations.
- for Clock ..... to select 12- or 24-hour clock mode.
- for Timer ..... to select CD programme mode as the wake up source.

#### 17 CLOCK-TIMER

- to view the clock, set the clock or set the timer.

#### 18 DIM

- to select different brightness for the display screen : DIM 1, DIM 2, DIM 3 or DIM OFF.

#### 19

- to connect headphones.

#### 20 MASTERVOLUME (VOL +/-)

- to increase or decrease the volume.

#### 21 Display screen

- to view the current status of the system.

#### 22 Disc tray

#### 23 REPEAT

- to playback track(s)/disc(s)/programme repeatedly

#### 24 SHUFFLE

- to playback all available discs and their tracks/programme in random order.

#### 25 MUTE

- to interrupt or resume sound reproduction.

#### 26 SLEEP

- to activate/deactivate or set the sleep timer.

#### 27

- to switch the system to standby mode.
- to switch the system to Eco Power standby mode.

### Important notes for users in the U.K.

#### Mains plug

This apparatus is fitted with an approved 13 Amp plug. To change a fuse in this type of plug proceed as follows:

- 1 Remove fuse cover and fuse.
- 2 Fix new fuse which should be a BS1362 5 Amp, A.S.T.A. or BSI approved type.
- 3 Refit the fuse cover.

If the fitted plug is not suitable for your socket outlets, it should be cut off and an appropriate plug fitted in its place.

If the mains plug contains a fuse, this should have a value of 5 Amp. If a plug without a fuse is used, the fuse at the distribution board should not be greater than 5 Amp.

**Note:** These vered plug must be disposed of to avoid a possible shock hazard should it be inserted into a 13 Amp socket else where.

#### How to connect a plug

The wires in the mains lead are coloured with the following code: blue = neutral (N), brown = live (L).

- As these colours may not correspond with the colour markings identifying the terminals in your plug, proceed as follows:
  - Connect the blue wire to the terminal marked N or coloured black.
  - Connect the brown wire to the terminal marked L or coloured red.
  - Do not connect either wire to the earth terminal in the plug, marked E (or  $\oplus$ ) or coloured green (or green and yellow).

Before replacing the plug cover, make certain that the cord grip is clamped over the sheath of the lead - not simply over the two wires.

#### Copyright in the U.K.

Recording and playback of material may require consent. See Copyright Act 1956 and The Performer's Protection Acts 1958 to 1972.

### Italia

#### DICHIARAZIONE DI CONFORMITA'

Si dichiara che l'apparecchio FW-C717 Philips risponde alle prescrizioni dell'art. 2 comma 1 del D.M. 28 Agosto 1995 n. 548.

Fatto a Eindhoven

Philips Consumer Electronics  
Philips, Glaslaan 2  
5616 JB Eindhoven, The Netherlands

### Norge

Typeskilt finnes på apparatets underside.

**Observer:** Nettbodyeren er sekundært innkoplet. Den innebygde nettdelen er derfor ikke frakoplet nettet så lenge apparatet er tilsluttet nettkontakten.

For å redusere faren for brann eller elektrisk støt, skal apparatet ikke utsettes for regn eller fuktighet.

### CAUTION

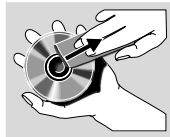
**Use of controls or adjustments other than performance of procedures other than herein may result in hazardous radiation exposure or other unsafe operation.**

## Cleaning the Cabinet

Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

## Cleaning Discs

When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the centre out.



Do not use solvents such as benzene, thinner, commercially available cleaners, or antistatic spray intended for analogue records.

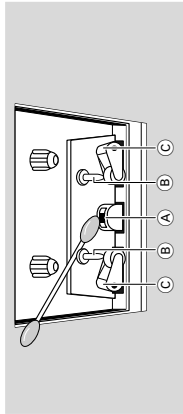
## Cleaning the disc lens

After prolonged use, dirt or dust may accumulate at the disc lens. To ensure good playback quality, clean the disc lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

## Cleaning the Heads and the Tape Paths

To ensure good recording and playback quality, clean the heads (A), the capstan(s) (B), and pressure roller(s) (C) after every 50 hours of tape operation.

Use a cotton swab slightly moistened with cleaning fluid or alcohol. You can also clean the heads by playing a cleaning tape once.



## Demagnetising the heads

Use a demagnetising tape available at your dealer.

## RADIO RECEPTION

### Radio reception is poor

- If the signal is too weak, adjust the antenna or connect an external antenna for better reception.
- Increase the distance between the Mini HiFi System and your TV or VCR.

## TAPE OPERATION/RECORDING

### Recording or playback cannot be made.

- Clean deck parts, see "Maintenance".
- Use only NORMAL (IEC I) tape.
- Apply a piece of adhesive tape over the missing tab space.

### The tape deck door cannot open.

- Remove and reconnect the AC power plug and switch on the system again.

## GENERAL

### The system does not react when buttons are pressed.

- Remove and reconnect the AC power plug and switch on the system again.

### Sound cannot be heard or is of poor quality.

- Adjust the volume.
- Disconnect the headphones.
- Check that the speakers are connected correctly.
- Check if the stripped speaker wire is clamped.
- Check the speaker connections and location.

### The left and right sound outputs are reversed.

- Check the speaker connections and location.

### The remote control does not function properly.

- Select the source (CD 1/2/3 or TUNER, for example) before pressing the function button (▶, ◀, ▶, ▶).
- Reduce the distance between the remote control and the system.
- Insert the batteries with their polarities (+/- signs) aligned as indicated.
- Replace the batteries.
- Point the remote control directly towards the IR sensor.

### The timer is not working.

- Set the clock correctly.
- Press and hold CLOCK•TIMER to switch on the timer.
- If recording or tape dubbing is in progress, stop recording.

### Not all lighted buttons are showing light.

- Press DIM to select DIM OFF display mode.

### The Clock/Timer setting is erased.

- Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.

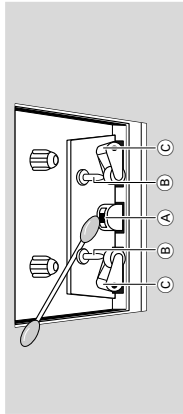
### The system displays features automatically

- Press and hold ■ on the system to switch off the demonstration.

## WARNING

Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair. If you are unable to solve a problem by following these hints, consult your dealer or service centre.



## Solution

Insert a disc.

Check if the disc is inserted upside down.

Wait until the moisture condensation at the lens has cleared.

Replace or clean the disc, see "Maintenance".

Use a finalised CD-RW or CD-R.

## WARNING

Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair. If you are unable to solve a problem by following these hints, consult your dealer or service centre.

## Solution

### CD OPERATION

#### "NO DISC" is displayed.

- Insert a disc.
- Check if the disc is inserted upside down.
- Wait until the moisture condensation at the lens has cleared.
- Replace or clean the disc, see "Maintenance".
- Use a finalised CD-RW or CD-R.



## DISMANTLING INSTRUCTIONS

### Dismantling the 3CDC Module

- 1) Loosen the 4 screws, slide Cover top (pos 255) towards the rear and remove it upwards.
- 2) Loosen 3 screws slide the Panel right (pos 254) towards the rear and remove it outwards. Do likewise for the Panel left (pos 253).
- 3) Push the gear slowly towards the front as shown in figure 2 until the CDC tray starts to move out of the Front Cabinet (pos 101). The CDC tray is now disengage and can be pulled out completely.

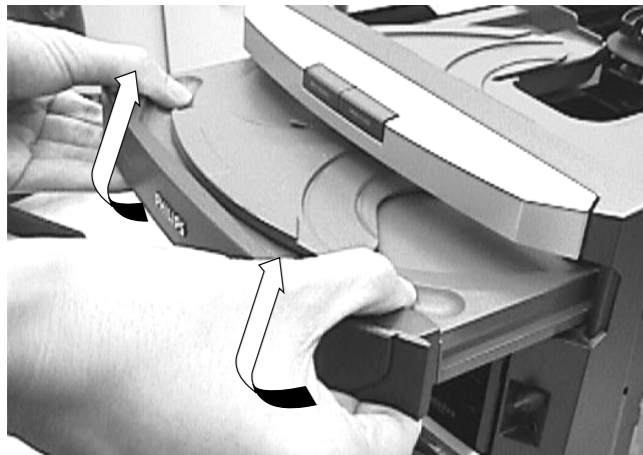


Figure 1

- 4) Remove the Cover Tray (pos 106) as shown in figure 1.
- 5) Loosen 4 screws A to remove the CDC Module (pos 1104) as shown in figure 2.

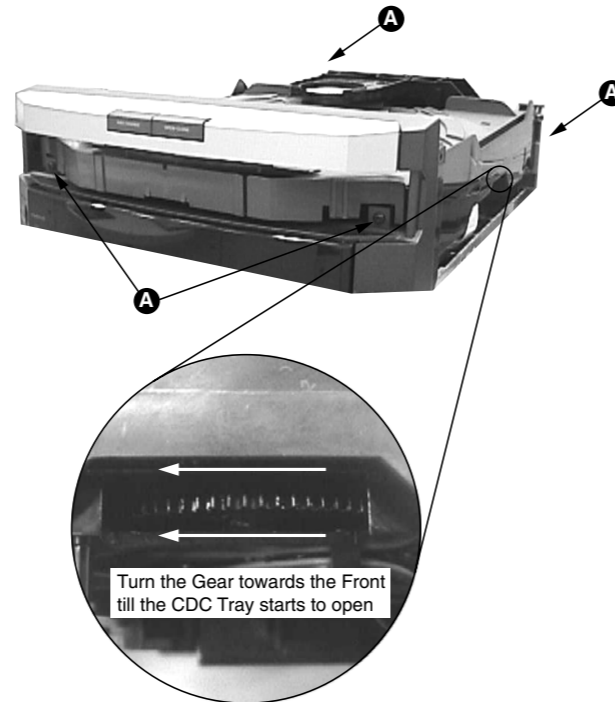


Figure 2

### Dismantling of the Volume & Jog Rotary knobs

- 1) Cut a piece of packaging tape approximately 5cm width by 12cm length and tape its narrow side on to the top and bottom side of the Volume knob (pos 139) as shown in figure 3.



Figure 3

- 2) Place a small screw driver in between the tape & knob (see figure 3) to give more leverage in pulling out the knob as shown in figure 4.
- 3) Do likewise for the Jog Rotary knob (pos 138). You may have to rotate the knob to provide the most exposed area during application of the packaging tape.

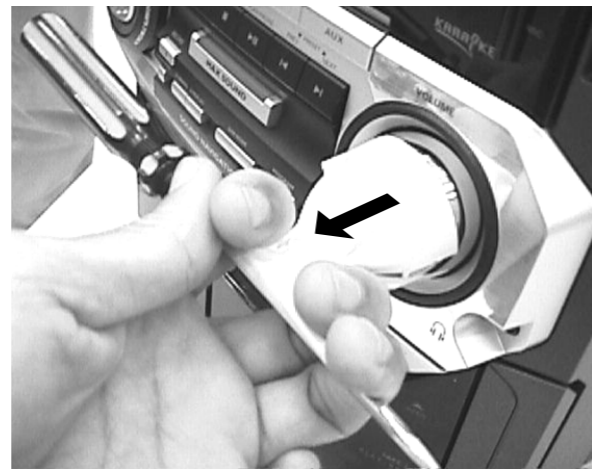


Figure 4

### Dismantling of the Front Panel assembly

- 1) Loosen 2 screws below the Front Panel (pos 101) mounting it to the Bottom plate (pos 265).
- 2) Release the 2 catches on the sides of the Front Panel to separate it from the Bottom plate.
- 3) Remove the Volume and Jog Rotary knob if the Front board needs to be dismantled. For Karaoke versions, the Karaoke knob (pos 133) also need to be removed.

- 4) Loosen 8 screws B to remove the Front board as shown in Figure 5.
- 5) Loosen 6 screws C and eject both cassette doors to remove the Tape mechanism (pos 1103) as shown in figure 6.

**Note: The Cassette door can be removed only after the removal of the Tape mechanism and buttons.**

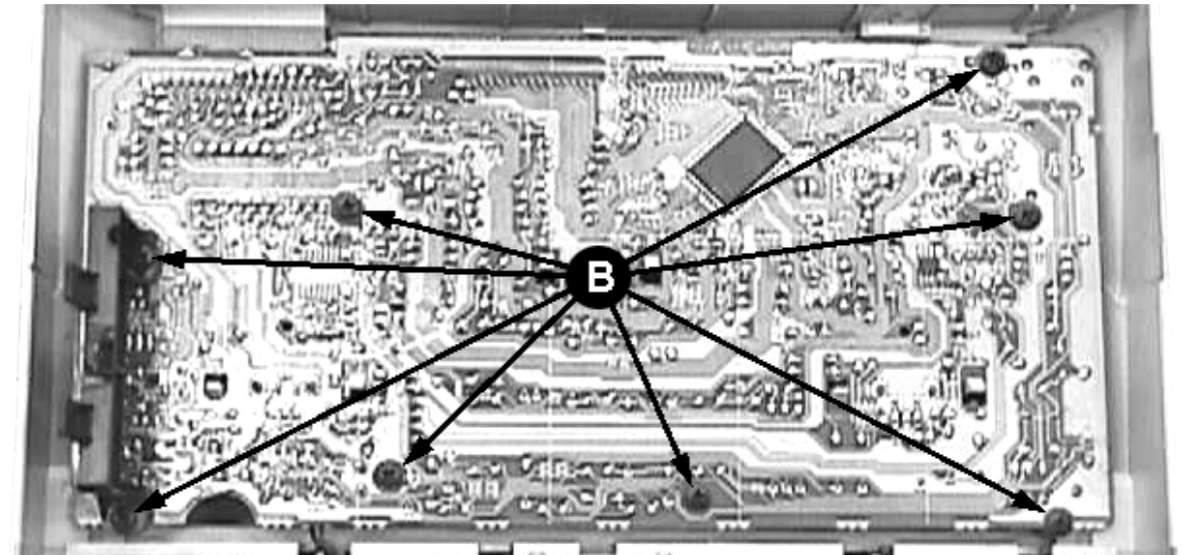


Figure 5

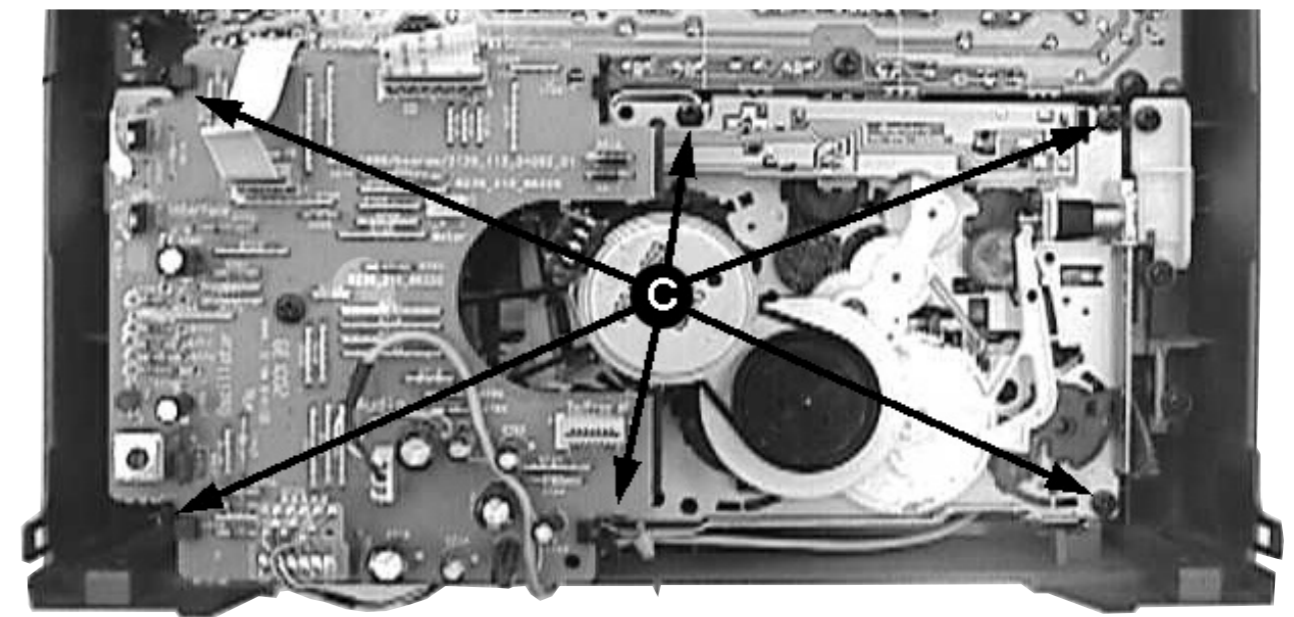


Figure 6

### ***Dismantling of the Bottom & Rear Panel assembly***

- 1) Loosen 5 screws D mounting the Combi board to the Rear Panel (pos 256) as shown in figure 7.
- 2) Loosen 3 screws E and release the 2 catches on the sides of the Rear Panel to separate it from the Bottom plate (pos 265).
- 3) Loosen 4 screws G to remove the Mains Transformer as shown in figure 8.
- 4) Loosen 2 screws F to remove the Combi Board.

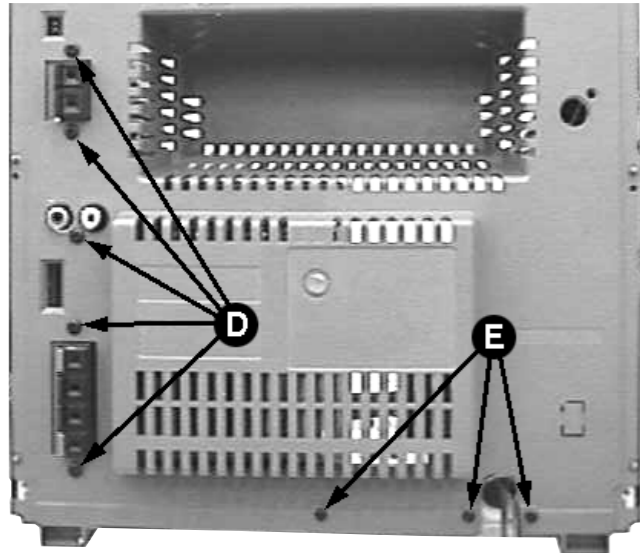
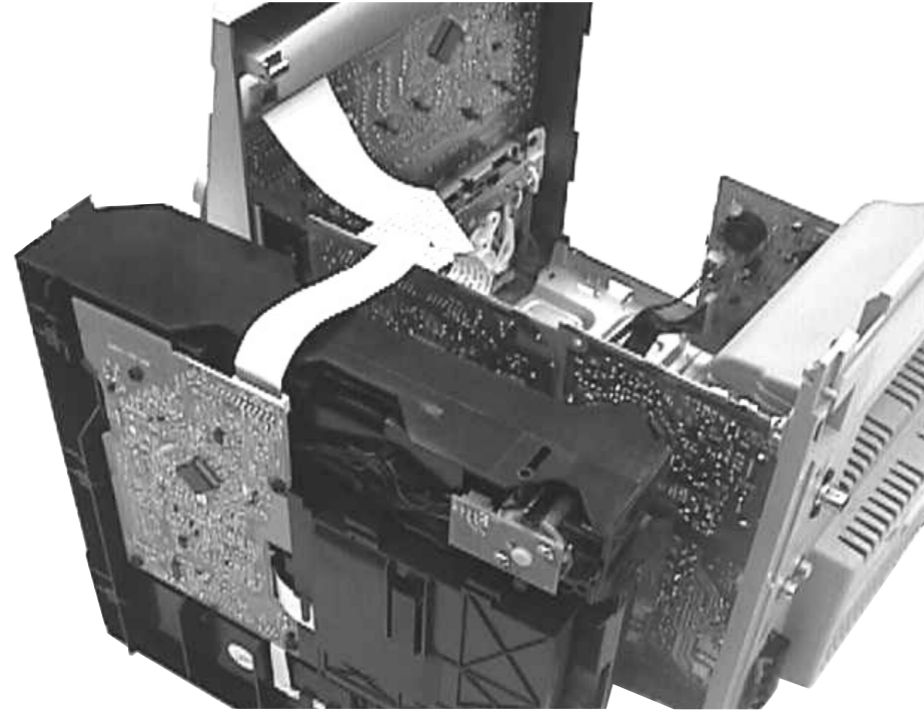
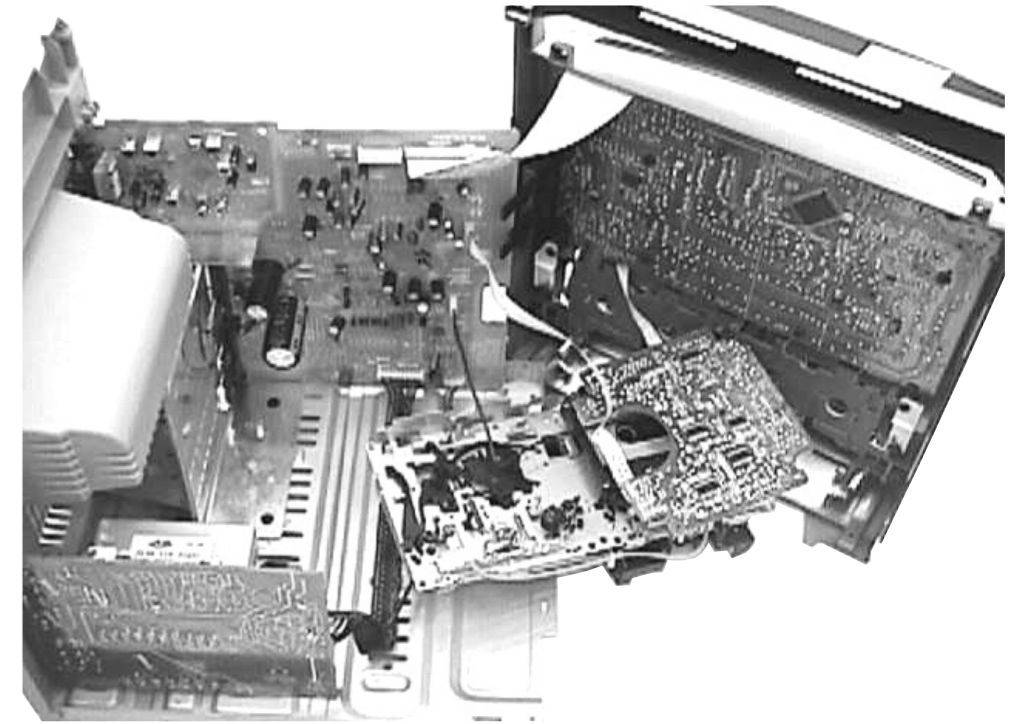


Figure 7

Service pos A



Service pos C



Service pos B

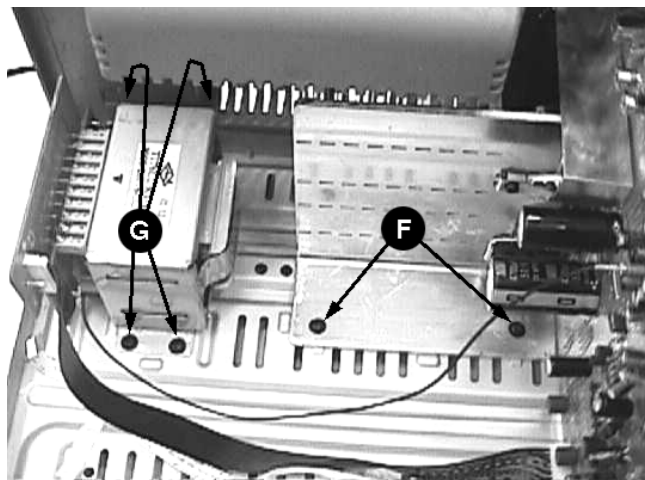
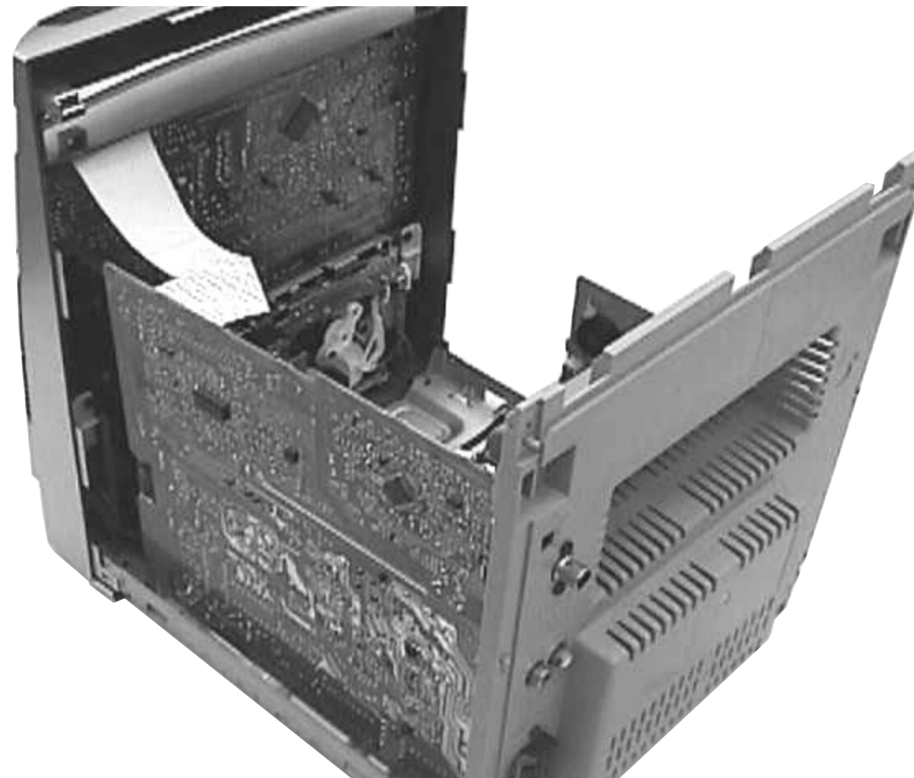


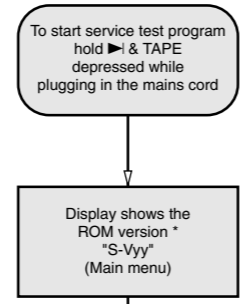
Figure 8

Note: After re-assembly, it is very important to ensure all wires are routed properly to ensure that they do not touch/obstruct all moving parts.

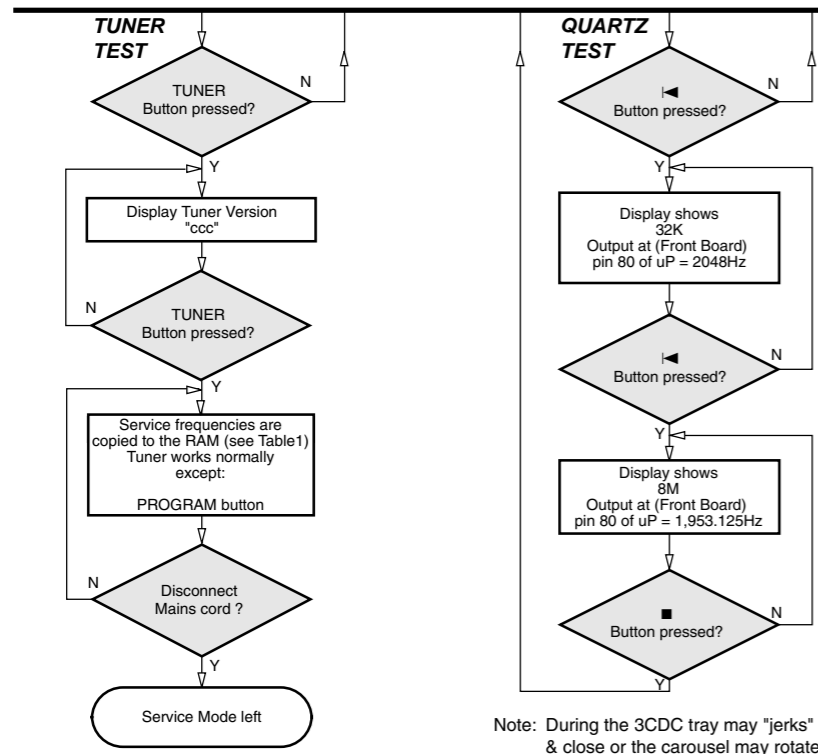
The 3CDC Module can be complete detached while repairing the other portion of the set.



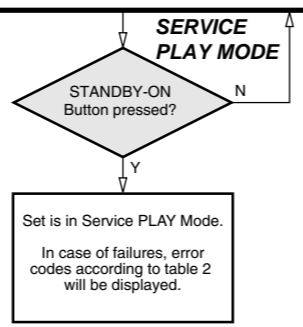
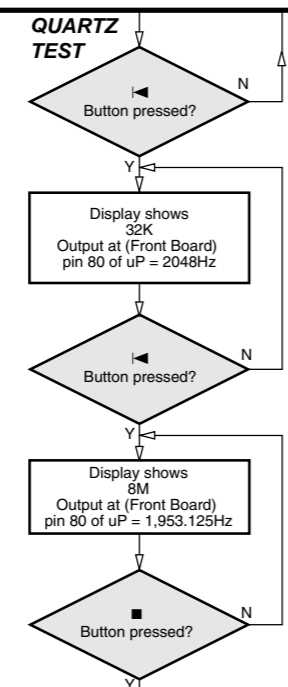
# SERVICE TEST PROGRAM



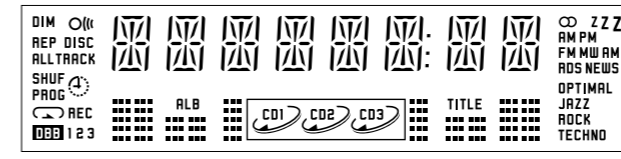
S refers to Service Mode.  
 V refers to Version.  
 yy refers to Software version number of Processor.  
 (Counting up from 01 to 99)



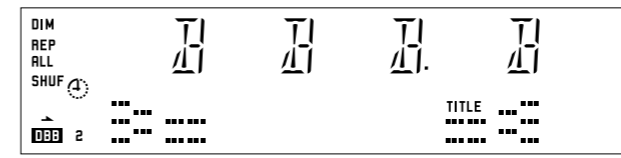
Note: During the 3CDC tray may "jerk" open & close or the carousel may rotate slightly. This is due to sharing of control lines during the Service test program.



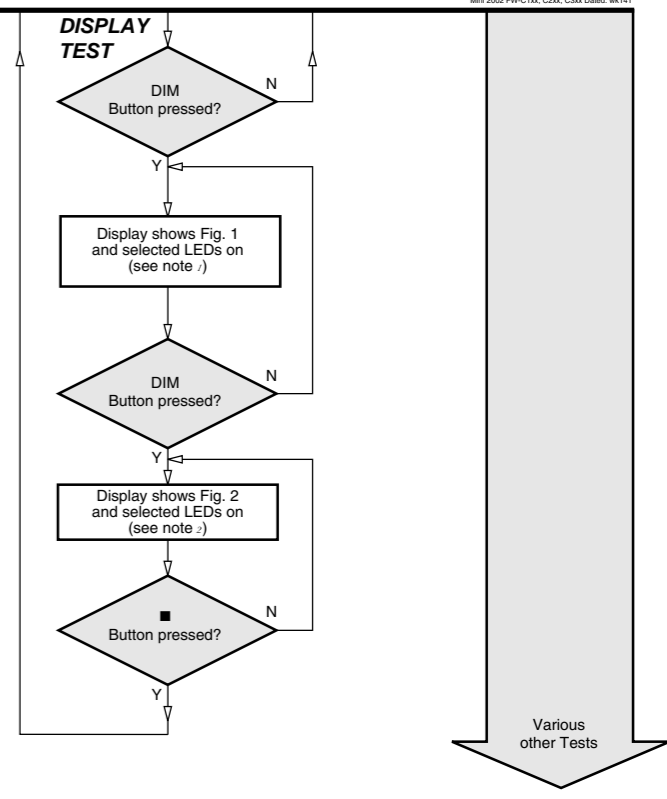
The Service Play Mode is intended to detect and identify the failures in the CD Mode.  
 In this mode the electronics will still function even when an error is detected so that repair activities can be carried out.



note 1: JAZZ & TECHNO are on while OPTIMAL is off, other LEDs status are not important (applicable only for sets with LEDs)  
 Figure 1



note 2: OPTIMAL is on while JAZZ & TECHNO are off, other LEDs status are not important (applicable only for sets with LEDs)  
 Figure 2



PRESET	Europe "EUR"	East Eur. Extended-band "EAS"	East Eur. "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	530/531kHz*
4	1602kHz	87.5MHz	1602kHz	1700kHz	1700/1602kHz*
5	558kHz	531kHz	558kHz	560kHz	560/558kHz*
6	1494kHz	1602kHz	1494kHz	1500kHz	1500/1494kHz*
7	87.5MHz	558kHz	87.5MHz	98MHz	98/87.5MHz*
8	87.5MHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	87.5MHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	87.5MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	98MHz	65.81MHz	98MHz	87.5MHz	87.5/98MHz*

Table 1

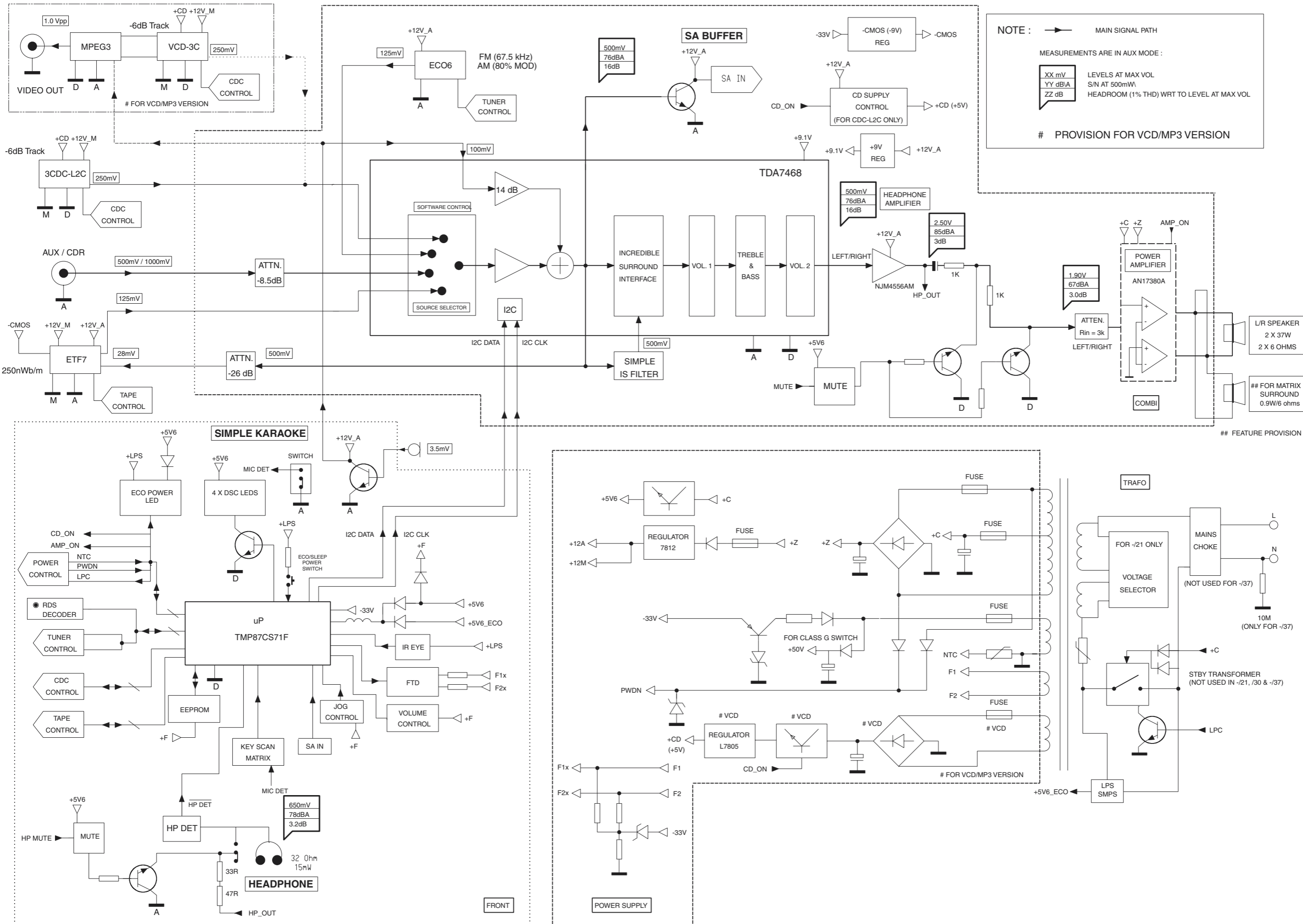
Note: \* Depending on the selected grid frequency (9 or 10kHz)  
 By holding the TUNER and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:  
 - the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.  
 - the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1070	This happens when the carousel switch is defective and closed all the time, or when the carousel is blocked when it is located exactly at a disc position.
E1071	This happens when the carousel switch is defective and does not closed electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	The drawer could not open or enter the inside position and is opening again. This happen when the drawer is blocked and cannot go fully inside or when the drawer switch is defective and does not close.

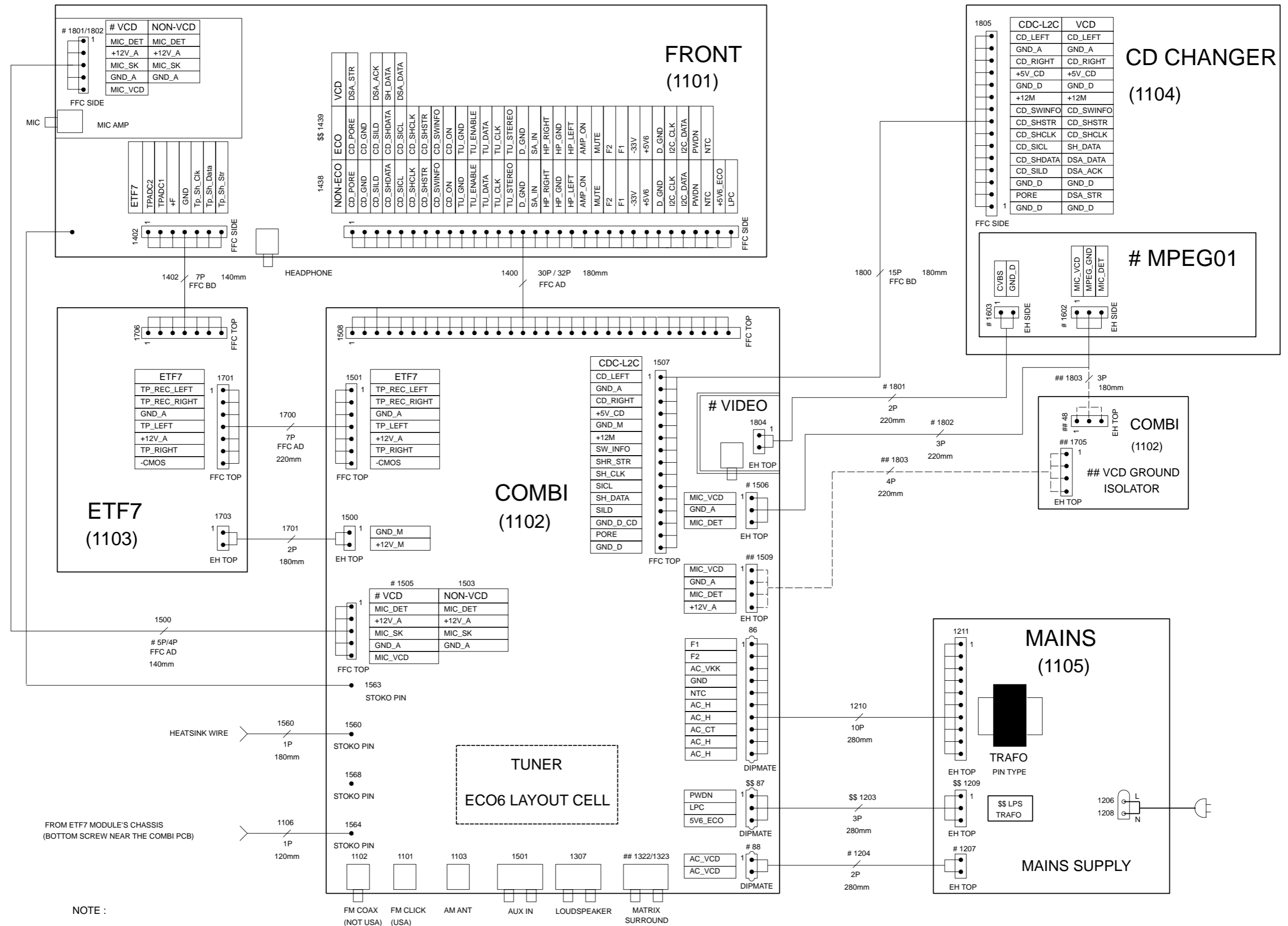
Table 2

TEST	Activated with	ACTION
EEPROM TEST	►►	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT	◄◄	Load default data. Display shows "NEW" for 1 second. <b>Caution!</b> <b>All presets from the customer will be lost!!</b>
ROTARY ENCODER TEST	Volume Knob or Jog Shuttle knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DEMO	DBB	DEMO will toggle on or off. The message: "DEMO ON" or "DEMO OFF" will scroll across the display to show the new status of the set.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

# SET BLOCK DIAGRAM



SET WIRING DIAGRAM



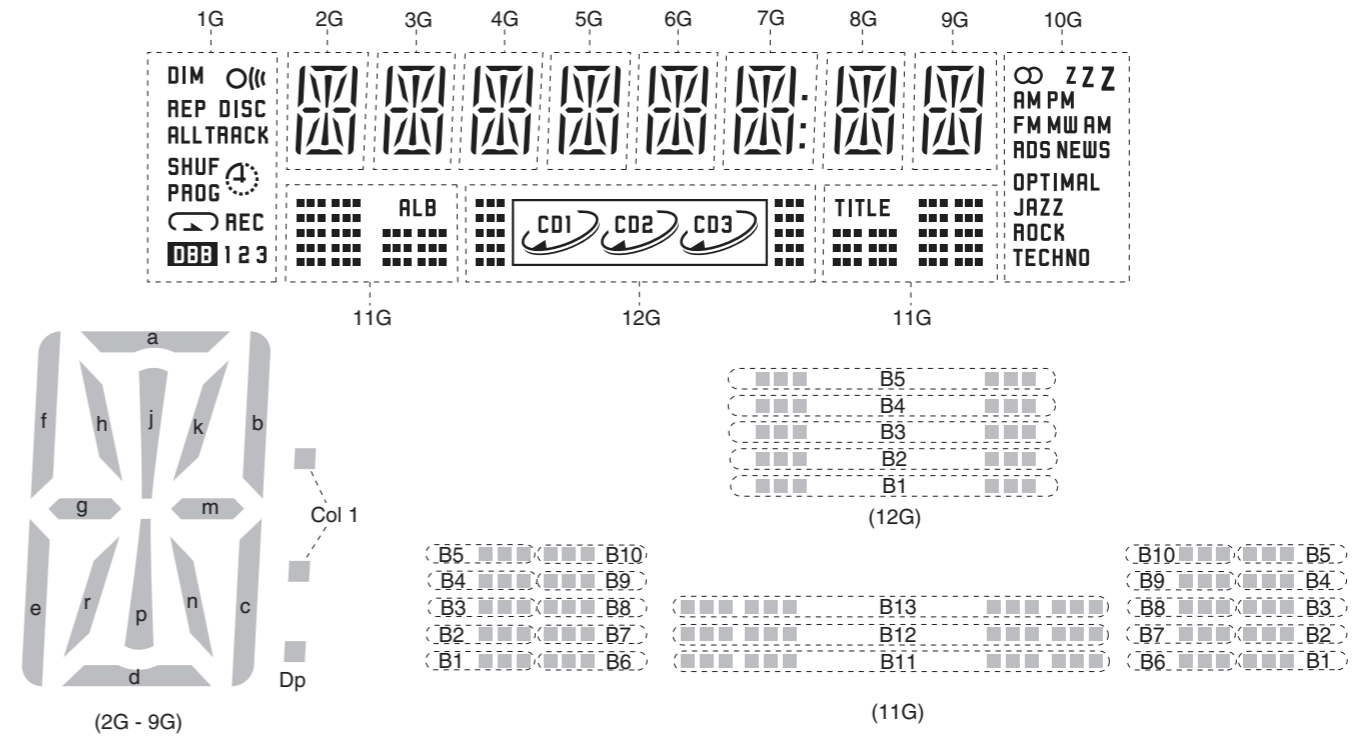
# - PROVISION FOR SETS WITH VCD/MP3 FEATURE .  
 ## - PROVISION FOR SETS WITH MATRIX SURROUND & VCD GROUND ISOLATOR .  
 \$\$ - PROVISION FOR SETS WITH ECO FEATURE (ONLY FOR -/22/34 VER.) .

# FRONT BOARD

## TABLE OF CONTENTS

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## FTD DISPLAY PIN CONNECTIONS



	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	B1	B1	∞	a	a	a	a	a	a	a	a	DIM
P2	B2	B2	Z (Left)	h	h	h	h	h	h	h	h	O((
P3	B3	B3	Z (Middle)	j, p	j, p	j, p	j, p	j, p	j, p	j, p	j, p	REP
P4	B4	B4	Z (Right)	k	k	k	k	k	k	k	k	DISC
P5	B5	B5	AM (Up)	b	b	b	b	b	b	b	b	ALL
P6	CD1	B6	PM	f	f	f	f	f	f	f	f	TRACK
P7	CD2	B7	FM	m	m	m	m	m	m	m	m	SHUF
P8	CD3	B8	MW	g	g	g	g	g	g	g	g	PROG
P9	(1)	B9	AM (Low)	c	c	c	c	c	c	c	c	(Clock)
P10	(2)	B10	RDS	e	e	e	e	e	e	e	e	(Arrow)
P11	(3)	B11	NEWS	r	r	r	r	r	r	r	r	(Triangle)
P12	(Box)	B12	OPTIMAL	n	n	n	n	n	n	n	n	REC
P13	-	B13	JAZZ	d	d	d	d	d	d	d	d	DBB
P14	-	ALB	ROCK	-	-	Col	-	-	-	-	-	1
P15	-	TITLE	TECHNO	-	-	Dp	-	-	-	-	-	2
P16	-	-	-	-	-	-	-	-	-	-	-	3

FTD DISPLAY PIN NO.	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	9	8	7	6	5	4	3	2	1	
FUNCTION	F	-	-	-	1	2	3	4	5	6	7	8	9	10	11	12	-	-	-	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	-	-	-	F

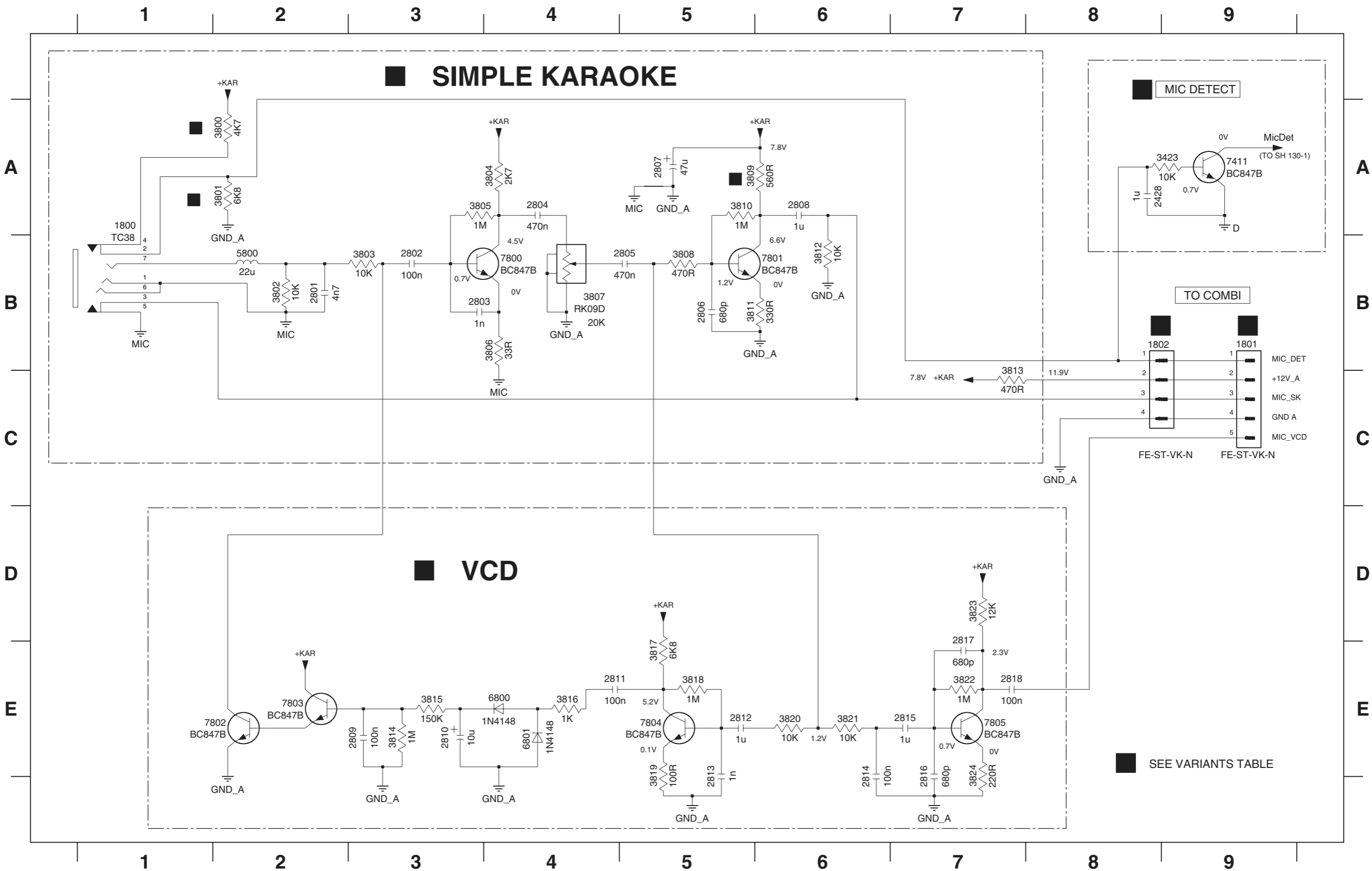
FEATURES:	FW-C330/21M/33	FW-C330/22	FW-C330/30	FW-C330/34
Karaoke / Mic Detect	x	-	-	-
VCD	-	-	-	-
NEWS	-	x	-	x
RDS	-	x	-	x
ECO Power LED	-	x	-	x

ITEM NO.	FW-C330/21M	FW-C330/22	FW-C330/30	FW-C330/34	Functions
1427	-	x	-	x	REC
1428	REC	AUTO	REC	AUTO	
1432	AUTO	RDS	AUTO	RDS	
1433	-	NEWS	-	NEWS	
1438	-	x	-	x	with LPC
1439	x	-	x	-	without LPC
1801	-	-	-	-	VCD & KARAOKE
1802	x	-	-	-	KARAOKE
3529	-	330R	-	330R	P01
3546	10k	-	10k	-	RDSCLK
3548	10k	-	10k	-	RSDAT
3549	10k	-	10k	-	RESET
3565	4R7	2R2	4R7	2R2	FTD Filament
3566	-	2R2	-	2R2	FTD Filament
3567	4R7	2R2	4R7	2R2	FTD Filament
3568	-	2R2	-	2R2	FTD Filament
3569	10k	-	10k	-	LPC
3570	-	100k	-	100k	RESET
3800	4k7	-	-	-	KARAOKE
3801	6k8	-	-	-	KARAOKE
3809	560R	-	-	-	KARAOKE
4408	x	x	x	x	CDSICL
4409	x	-	x	-	+5V6
4410	-	-	-	-	SH_DATA
4411	-	x	-	x	HP_GND
4414	x	-	x	-	DLPC
4416	x	-	x	-	# AUTO
4417	-	x	-	x	AUTO
4419	x	-	x	-	RESET
4459	-	x	-	x	+5V6_ECO
4490	x	-	x	-	+5V6
4491	x	-	x	-	# REC
6401	-	x	-	x	+5V6_ECO
6417	-	x	-	x	P01
6429	x	-	-	-	KARAOKE
6430	-	x	-	x	ECO Power
9401	x	-	x	-	FTD Filament
9402	x	-	x	-	FTD Filament
9410	-	-	-	-	DSA_DATA
9411	-	x	-	x	+LPS
9416	x	x	x	x	CDSHDATA
9488	-	x	-	x	LPC
9506	-	x	-	x	+5V6_ECO
9514	-	x	-	x	+5V6_ECO

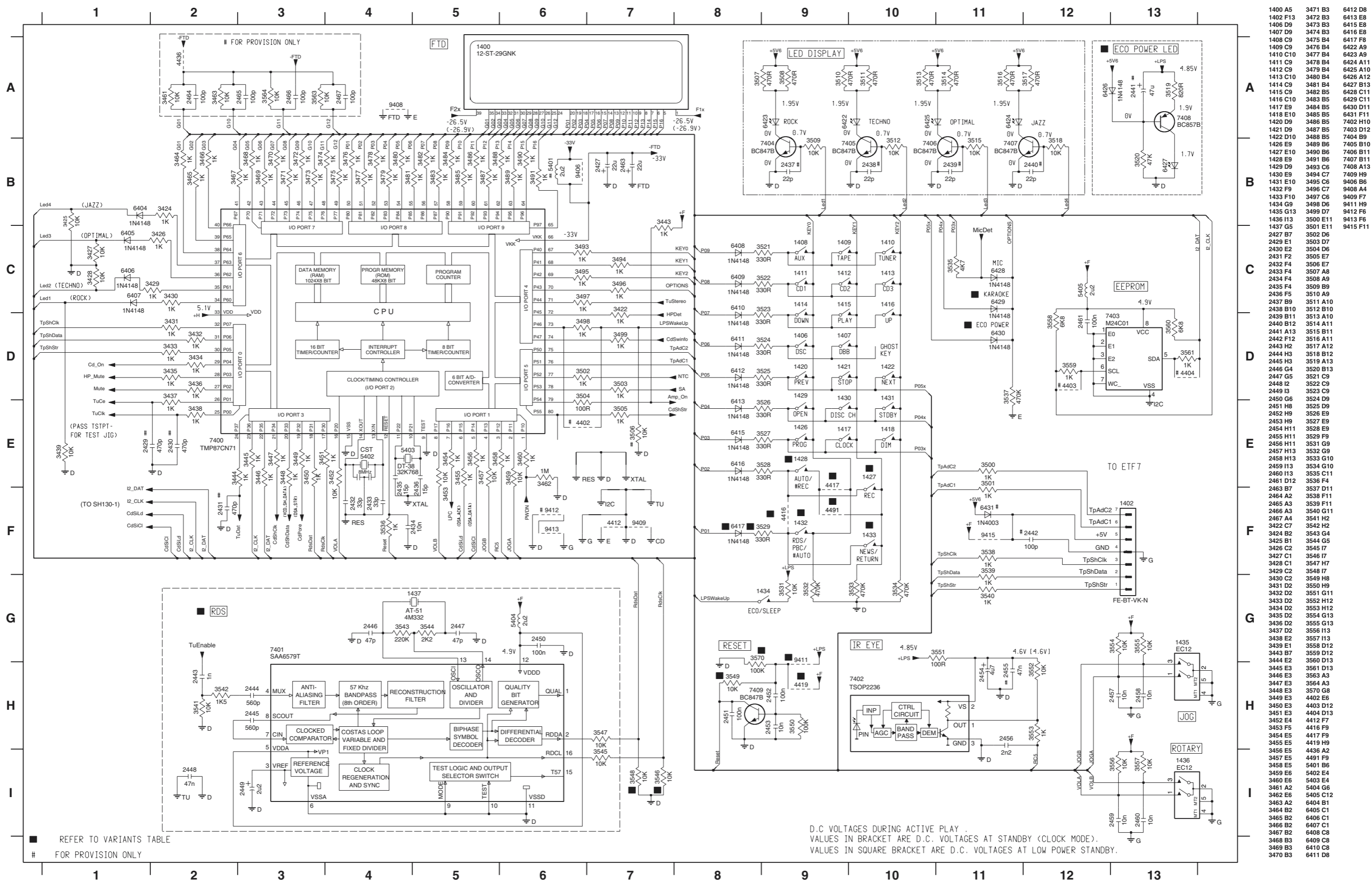
x = Item in use.

# CIRCUIT DIAGRAM - KARAOKE PART

1800 A1	2428 A8	2803 B3	2806 B5	2809 E3	2812 E5	2815 E7	2818 E7	3801 A2	3804 A4	3807 B4	3810 A5	3813 C7	3816 E4	3819 E5	3822 E7	5800 B2	7411 A9	7802 E2	7805 E7
1801 B9	2801 B2	2804 A4	2807 A5	2810 E3	2813 E5	2816 E7	3423 A9	3802 B2	3805 A3	3808 B5	3811 B5	3814 E3	3817 E5	3820 E6	3823 D7	6800 E4	7800 B4	7803 E2	
1802 B8	2802 B3	2805 B5	2808 A6	2811 E4	2814 E6	2817 E7	3800 A2	3803 B3	3806 B4	3809 A5	3812 B6	3815 E3	3818 E5	3821 E6	3824 E7	6801 E4	7801 B6	7804 E5	



# CIRCUIT DIAGRAM - MICROPROCESSOR PART



1400 A5	3471 B3	6412 D8
1402 F13	3472 B3	6413 E8
1406 D9	3473 B3	6415 E8
1407 D9	3474 B3	6416 E8
1408 C9	3475 B4	6417 F8
1409 C9	3476 B4	6422 A9
1410 C10	3477 B4	6423 A9
1411 C9	3478 B4	6424 A11
1412 C9	3479 B4	6425 A10
1413 C10	3480 B4	6426 A12
1414 C9	3481 B4	6427 B11
1415 C9	3482 B5	6428 C13
1416 C10	3483 B5	6429 C11
1417 E9	3484 B5	6430 D11
1418 E10	3485 B5	6431 F11
1420 D9	3486 B5	7402 H10
1421 D9	3487 B5	7403 D12
1422 D10	3488 B5	7404 B9
1426 E9	3489 B6	7405 B10
1427 E10	3490 B6	7406 B11
1428 E9	3491 B6	7407 B11
1429 D9	3492 C7	7408 A13
1430 E9	3493 C7	7409 H9
1431 E10	3494 C7	9406 B6
1432 F9	3495 C6	9408 A4
1433 F10	3497 C6	9409 F7
1434 G9	3498 C6	9411 H9
1435 G13	3499 D7	9412 F6
1436 I13	3500 E11	9413 F6
1437 G5	3501 E11	9415 F11
2427 B7	3502 D6	
2429 E1	3503 D7	
2430 E2	3504 D6	
2431 F2	3505 E7	
2432 F4	3506 E7	
2433 F4	3507 A8	
2434 F4	3508 A9	
2435 F4	3509 B9	
2436 F5	3510 A8	
2437 B9	3511 A10	
2438 B10	3512 B10	
2439 B11	3513 A10	
2440 B12	3514 A11	
2441 A13	3515 B11	
2442 F12	3516 A11	
2443 H2	3517 A12	
2444 H3	3518 B12	
2445 H3	3519 A13	
2446 G4	3520 B13	
2447 G5	3521 C9	
2448 I2	3522 C9	
2449 I3	3523 C9	
2450 G6	3524 D9	
2451 H8	3525 D9	
2452 H9	3526 E9	
2453 H9	3527 E9	
2454 H11	3528 E9	
2455 H11	3529 F9	
2456 H11	3531 G9	
2457 H13	3532 G9	
2458 H13	3533 G10	
2459 I3	3534 G10	
2460 I13	3535 C11	
2461 D12	3536 F4	
2463 B7	3537 D11	
2464 A2	3538 F11	
2465 A3	3539 F11	
2466 A4	3540 G11	
2467 A4	3541 H2	
3422 C7	3542 H2	
3423 B2	3543 G4	
3425 B1	3544 G5	
3426 C2	3545 I7	
3427 C1	3546 I7	
3428 C1	3547 H7	
3429 C2	3548 I7	
3430 C2	3549 H8	
3431 D2	3550 H9	
3432 D2	3551 G11	
3433 D2	3552 H12	
3434 D2	3553 H12	
3435 D2	3554 G13	
3436 D2	3555 G13	
3437 D2	3556 I13	
3439 E1	3558 D12	
3443 B7	3559 D12	
3444 E2	3560 D13	
3445 E3	3561 D13	
3446 E3	3563 A3	
3447 E3	3564 A3	
3448 E3	3570 G8	
3449 E3	4402 E6	
3450 E3	4403 D12	
3451 E3	4404 D13	
3452 E4	4412 F7	
3453 F8	4416 F9	
3454 E5	4417 F9	
3455 E5	4419 H9	
3456 E5	4436 A2	
3457 E5	4491 F9	
3458 E5	5401 B6	
3459 E6	5402 E4	
3460 E6	5403 E4	
3461 A2	5404 G6	
3462 E6	5405 C12	
3463 A2	6404 B1	
3464 B2	6405 C1	
3465 B2	6406 C1	
3466 B2	6407 C1	
3467 B2	6408 C8	
3468 B3	6409 C8	
3469 B3	6410 C8	
3470 B3	6411 D8	

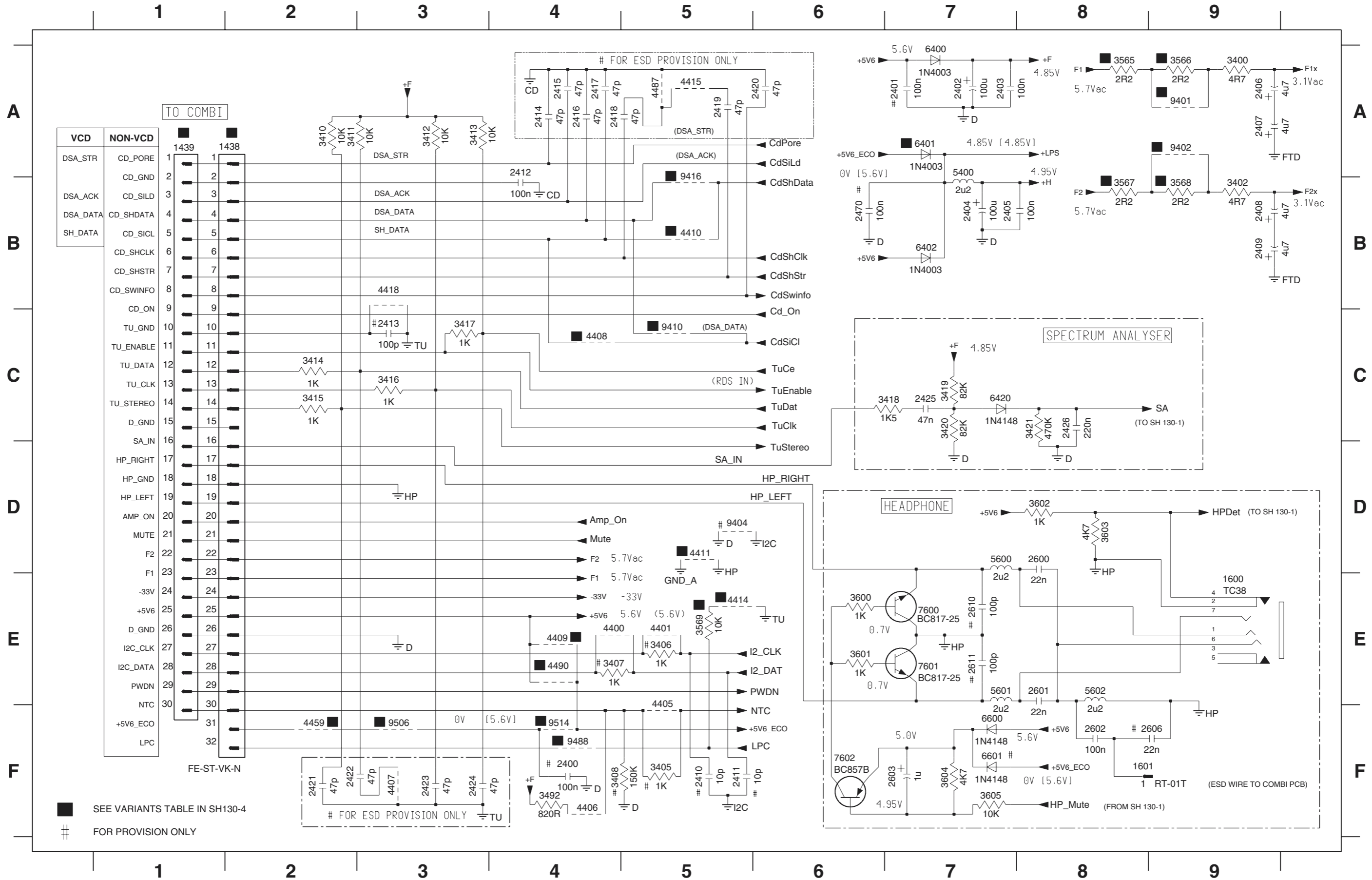
D.C. VOLTAGES DURING ACTIVE PLAY.  
 VALUES IN BRACKET ARE D.C. VOLTAGES AT STANDBY (CLOCK MODE).  
 VALUES IN SQUARE BRACKET ARE D.C. VOLTAGES AT LOW POWER STANDBY.

■ REFER TO VARIANTS TABLE  
 # FOR PROVISION ONLY



# CIRCUIT DIAGRAM - HEADPHONE / MISCELLANEOUS PART

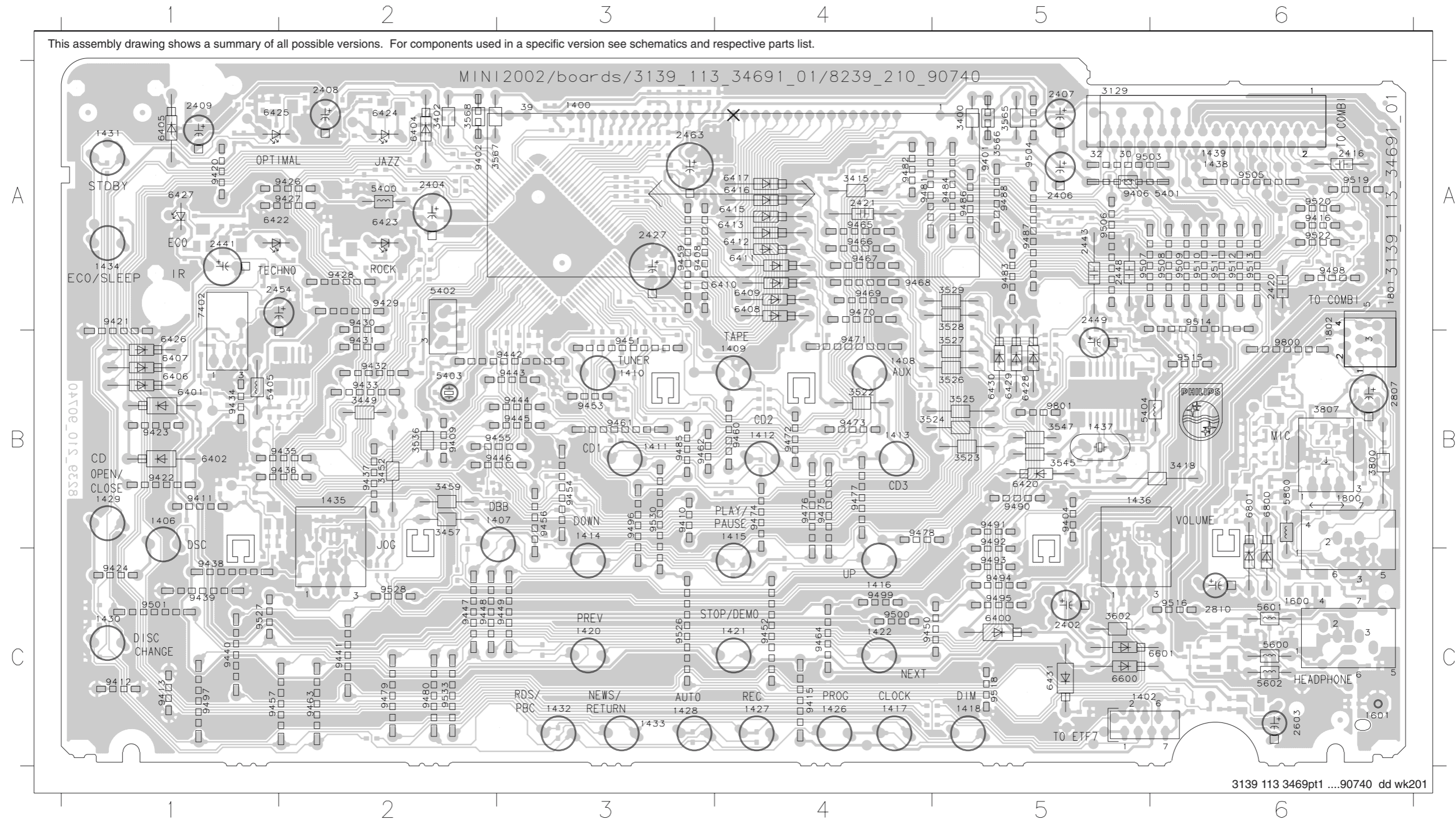
1438 A1	2400 F4	2404 B7	2408 B9	2412 A4	2416 A4	2420 A6	2424 F3	2600 D8	2606 F9	3402 B9	3408 F4	3413 A3	3417 C3	3421 C8	3567 B8	3601 E6	3605 F7	4406 F4	4410 B5	4418 B3	5400 A7	6400 A7	6600 F7	7602 F6	9410 C5	9514 F4
1439 A1	2401 A7	2405 B7	2409 B9	2413 C3	2417 A4	2421 F2	2425 C7	2601 E8	2610 E7	3405 F5	3410 A2	3414 C2	3418 C7	3492 F4	3568 B9	3602 D8	4400 E4	4407 F3	4411 D5	4459 F2	5600 D7	6401 A7	6601 F7	9401 A9	9416 B5	
1600 E9	2402 A7	2406 A9	2410 F5	2414 A4	2418 A4	2422 F2	2426 C8	2602 F8	2611 E7	3406 E5	3411 A2	3415 C2	3419 C7	3565 A8	3569 E5	3603 D8	4401 E5	4408 C4	4414 E5	4487 A5	5601 E7	6402 B7	7600 E7	9402 A9	9488 F4	
1601 F9	2403 A7	2407 A9	2411 F5	2415 A4	2419 A5	2423 F3	2470 B6	2603 F7	3400 A9	3407 E4	3412 A3	3416 C3	3420 C7	3566 A9	3600 E6	3604 F7	4405 F5	4409 E4	4415 A5	4490 E4	5602 E8	6420 C7	7601 E7	9404 D5	9506 F3	





# COMPONENT LAYOUT

1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500
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## ELECTRICAL PARTS LIST - FRONT BOARD

## MISCELLANEOUS

1400	3139 110 52850	FTD Display 12-ST-29GNK
1402	4822 267 10953	Flex Socket 7pin Vert.
1406	2422 128 02917	Tact Switch
1407	2422 128 02917	Tact Switch
1408	2422 128 02917	Tact Switch
1409	2422 128 02917	Tact Switch
1410	2422 128 02917	Tact Switch
1411	2422 128 02917	Tact Switch
1412	2422 128 02917	Tact Switch
1413	2422 128 02917	Tact Switch
1414	2422 128 02917	Tact Switch
1415	2422 128 02917	Tact Switch
1416	2422 128 02917	Tact Switch
1417	2422 128 02917	Tact Switch
1418	2422 128 02917	Tact Switch
1420	2422 128 02917	Tact Switch
1421	2422 128 02917	Tact Switch
1422	2422 128 02917	Tact Switch
1426	2422 128 02917	Tact Switch
1427	2422 128 02917	Tact Switch /22/34
1428	2422 128 02917	Tact Switch
1429	2422 128 02917	Tact Switch
1430	2422 128 02917	Tact Switch
1431	2422 128 02917	Tact Switch
1432	2422 128 02917	Tact Switch
1433	2422 128 02917	Tact Switch /22/34
1434	2422 128 02917	Tact Switch
1435	2422 129 16707	Rotary Encoder 24P
1436	2422 129 16708	Rotary Encoder 24P
1437	4822 242 11033	X'tal Resonator 4,332MHz /22/34
1438	2422 025 17413	Flex Socket 32pin Hort. /22/34
1439	2422 025 17414	Flex Socket 30pin Hort. /21M/30
1600	2422 026 05059	Headphone Socket
1800	2422 026 05059	Mic Socket /21M
1802	4822 265 11183	Flex Socket 4pin Hort. /21M

## CAPACITORS

2402	4822 124 23432	100µF 20% 10V
2403	2238 586 59812	100nF +80/-20% 50V
2404	4822 124 23432	100µF 20% 10V
2405	2238 586 59812	100nF +80/-20% 50V
2406	4822 124 12032	4,7µF 20% 50V
2407	4822 124 12032	4,7µF 20% 50V
2408	4822 124 12032	4,7µF 20% 50V
2409	4822 124 12032	4,7µF 20% 50V
2412	2238 586 59812	100nF +80/-20% 50V
2425	3198 017 34730	47nF 16V
2426	4822 126 13879	220nF +80/-20% 16V
2427	3198 028 52290	22µF 20% 50V
2428	3198 017 41050	1µF 10V /21M
2432	2222 867 15339	33pF 5% 50V
2433	2222 867 15339	33pF 5% 50V

## RESISTORS

3400	4822 050 24708	4R7 1% 0,6W
3402	4822 050 24708	4R7 1% 0,6W
3410	4822 051 30103	10k 5% 0,062W
3411	4822 051 30103	10k 5% 0,062W
3412	4822 051 30103	10k 5% 0,062W
3413	4822 051 30103	10k 5% 0,062W
3414	4822 051 30102	1k 5% 0,062W
3415	4822 050 11002	1k 1% 0,4W
3416	4822 051 30102	1k 5% 0,062W
3417	4822 051 30102	1k 5% 0,062W
3418	4822 116 52243	1k5 5% 0,5W
3419	4822 117 12864	82k 5% 0,6W
3420	4822 117 12864	82k 5% 0,6W
3421	4822 051 30474	470k 5% 0,062W
3422	4822 051 30102	1k 5% 0,062W
3423	4822 051 30103	10k 5% 0,062W /21M
3424	4822 051 30102	1k 5% 0,062W

## ELECTRICAL PARTS LIST - FRONT BOARD

3425	4822 051 30103	10k 5% 0,062W
3426	4822 051 30102	1k 5% 0,062W
3427	4822 051 30103	10k 5% 0,062W
3428	4822 051 30103	10k 5% 0,062W
3429	4822 051 30102	1k 5% 0,062W
3430	4822 051 30102	1k 5% 0,062W
3431	4822 051 30102	1k 5% 0,062W
3432	4822 051 30102	1k 5% 0,062W
3433	4822 051 30102	1k 5% 0,062W
3434	4822 051 30102	1k 5% 0,062W
3435	4822 051 30102	1k 5% 0,062W
3436	4822 051 30102	1k 5% 0,062W
3437	4822 051 30102	1k 5% 0,062W
3438	4822 051 30102	1k 5% 0,062W
3439	4822 051 30103	10k 5% 0,062W
3443	4822 051 30102	1k 5% 0,062W
3444	4822 051 30102	1k 5% 0,062W
3445	4822 051 30102	1k 5% 0,062W
3446	4822 051 30102	1k 5% 0,062W
3447	4822 051 30102	1k 5% 0,062W
3448	4822 051 30102	1k 5% 0,062W
3449	4822 050 11002	1k 1% 0,4W
3450	4822 051 30102	1k 5% 0,062W
3451	4822 051 30102	1k 5% 0,062W
3452	4822 050 21003	10k 1% 0,6W
3453	4822 051 30103	10k 5% 0,062W
3454	4822 051 30102	1k 5% 0,062W
3455	4822 051 30102	1k 5% 0,062W
3456	4822 051 30102	1k 5% 0,062W
3457	4822 050 21003	10k 1% 0,6W
3458	4822 051 30102	1k 5% 0,062W
3459	4822 050 21003	10k 1% 0,6W
3460	4822 051 30102	1k 5% 0,062W
3462	4822 051 30105	1M 5% 0,062W
3464	4822 051 30102	1k 5% 0,062W
3465	4822 051 30102	1k 5% 0,062W
3466	4822 051 30102	1k 5% 0,062W
3467	4822 051 30102	1k 5% 0,062W
3468	4822 051 30102	1k 5% 0,062W
3469	4822 051 30102	1k 5% 0,062W
3470	4822 051 30102	1k 5% 0,062W
3471	4822 051 30102	1k 5% 0,062W
3472	4822 051 30102	1k 5% 0,062W
3473	4822 051 30102	1k 5% 0,062W
3474	4822 051 30102	1k 5% 0,062W
3475	4822 051 30102	1k 5% 0,062W
3476	4822 051 30102	1k 5% 0,062W
3477	4822 051 30102	1k 5% 0,062W
3478	4822 051 30102	1k 5% 0,062W
3479	4822 051 30102	1k 5% 0,062W
3480	4822 051 30102	1k 5% 0,062W
3481	4822 051 30102	1k 5% 0,062W

3482	4822 051 30102	1k 5% 0,062W
3483	4822 051 30102	1k 5% 0,062W
3484	4822 051 30102	1k 5% 0,062W
3485	4822 051 30102	1k 5% 0,062W
3486	4822 051 30102	1k 5% 0,062W
3487	4822 051 30102	1k 5% 0,062W
3488	4822 051 30102	1k 5% 0,062W
3489	4822 051 30102	1k 5% 0,062W
3490	4822 051 30102	1k 5% 0,062W
3491	4822 051 30102	1k 5% 0,062W
3492	4822 117 12968	820R 5% 0,62W
3493	4822 051 30102	1k 5% 0,062W
3494	4822 051 30102	1k 5% 0,062W
3495	4822 051 30102	1k 5% 0,062W
3496	4822 051 30102	1k 5% 0,062W
3497	4822 051 30102	1k 5% 0,062W
3498	4822 051 30102	1k 5% 0,062W
3499	4822 051 30102	1k 5% 0,062W
3500	4822 051 30102	1k 5% 0,062W
3501	4822 051 30102	1k 5% 0,062W
3502	4822 051 30102	1k 5% 0,062W
3503	4822 051 30102	1k 5% 0,062W
3504	4822 051 30101	100R 5% 0,062W
3505	4822 051 30102	1k 5% 0,062W
3507	4822 051 30471	470R 5% 0,062W
3508	4822 051 30471	470R 5% 0,062W
3509	4822 051 30103	10k 5% 0,062W
3510	4822 051 30471	470R 5% 0,062W
3511	4822 051 30471	470R 5% 0,062W
3512	4822 051 30103	10k 5% 0,062W
3513	4822 051 30471	470R 5% 0,062W
3514	4822 051 30471	470R 5% 0,062W
3515	4822 051 30103	10k 5% 0,062W
3516	4822 051 30471	470R 5% 0,062W
3517	4822 051 30471	470R 5% 0,062W
3518	4822 051 30103	10k 5% 0,062W
3519	4822 117 12968	820R 5% 0,62W /22/34
3520	4822 117 12925	47k 1% 0,063W /22/34
3521	4822 051 30331	330R 5% 0,062W
3522	4822 116 52219	330R 5% 0,5W
3523	4822 116 52219	330R 5% 0,5W
3524	4822 116 52219	330R 5% 0,5W
3525	4822 116 52219	330R 5% 0,5W
3526	4822 116 52219	330R 5% 0,5W
3527	4822 116 52219	330R 5% 0,5W
3528	4822 116 52219	330R 5% 0,5W
3529	4822 116 52219	330R 5% 0,5W /22/34
3531	4822 051 30103	10k 5% 0,062W
3532	4822 051 30474	470k 5% 0,062W
3533	4822 051 30474	470k 5% 0,062W
3534	4822 051 30474	470k 5% 0,062W
3535	4822 051 30472	4k7 5% 0,062W



## ELECTRICAL PARTS LIST - FRONT BOARD

## RESISTORS

3536	4822 050 11002	1k 1% 0,4W	3812	4822 051 30103	10k 5% 0,062W /21M
3537	4822 051 30474	470k 5% 0,062W	3813	4822 051 30471	470R 5% 0,062W /21M
3538	4822 051 30102	1k 5% 0,062W	4400	4822 051 30008	OR Jumper 0603
3539	4822 051 30102	1k 5% 0,062W	4401	4822 051 30008	OR Jumper 0603
3540	4822 051 30102	1k 5% 0,062W	4405	4822 051 30008	OR Jumper 0603
3541	4822 051 30103	10k 5% 0,062W /22/34	4406	4822 051 30008	OR Jumper 0603
3542	4822 051 30152	1k5 5% 0,062W /22/34	4408	4822 051 30008	OR Jumper 0603
3543	4822 117 12891	220k 1% ERJ3E /22/34	4409	4822 051 30008	OR Jumper 0603 /21M/30
3544	4822 051 30222	2k2 5% 0,062W /22/34	4411	4822 051 30008	OR Jumper 0603 /22/34
3545	4822 050 21003	10k 1% 0,6W /22/34	4412	4822 051 30008	OR Jumper 0603
3546	4822 051 30103	10k 5% 0,062W /21M/30	4414	4822 051 30008	OR Jumper 0603 /21M/30
3547	4822 050 21003	10k 1% 0,6W /22/34	4416	4822 051 30008	OR Jumper 0603 /21M/30
3548	4822 051 30103	10k 5% 0,062W /21M/30	4417	4822 051 30008	OR Jumper 0603 /22/34
3549	4822 051 30103	10k 5% 0,062W /21M/30	4418	4822 051 30008	OR Jumper 0603
3550	4822 117 13632	100k 1% 0,62W	4419	4822 051 30008	OR Jumper 0603 /21M/30
3551	4822 051 30101	100R 5% 0,062W	4420	4822 051 30008	OR Jumper 0603
3552	4822 051 30103	10k 5% 0,062W	4421	4822 051 30008	OR Jumper 0603
3553	4822 051 30102	1k 5% 0,062W	4422	4822 051 30008	OR Jumper 0603
3554	4822 051 30103	10k 5% 0,062W	4423	4822 051 30008	OR Jumper 0603
3555	4822 051 30103	10k 5% 0,062W	4424	4822 051 30008	OR Jumper 0603
3556	4822 051 30103	10k 5% 0,062W	4425	4822 051 30008	OR Jumper 0603
3557	4822 051 30103	10k 5% 0,062W	4426	4822 051 30008	OR Jumper 0603
3558	4822 051 30682	6k8 5% 0,062W	4427	4822 051 30008	OR Jumper 0603
3559	4822 051 30102	1k 5% 0,062W	4428	4822 051 30008	OR Jumper 0603
3560	4822 051 30682	6k8 5% 0,062W	4429	4822 051 30008	OR Jumper 0603
3561	4822 051 30102	1k 5% 0,062W	4430	4822 051 30008	OR Jumper 0603
3565	4822 050 24708	4R7 1% 0,6W /21M/30	4431	4822 051 30008	OR Jumper 0603
3565	4822 116 81154	2R2 5% 0,5W /22/34	4432	4822 051 30008	OR Jumper 0603
3566	4822 116 81154	2R2 5% 0,5W /22/34	4433	4822 051 30008	OR Jumper 0603
3567	4822 050 24708	4R7 1% 0,6W /21M/34	4434	4822 051 30008	OR Jumper 0603
3567	4822 116 81154	2R2 5% 0,5W /22/34	4435	4822 051 30008	OR Jumper 0603
3568	4822 116 81154	2R2 5% 0,5W /22/34	4437	4822 051 30008	OR Jumper 0603
3569	4822 051 30103	10k 5% 0,062W /21M/30	4438	4822 051 30008	OR Jumper 0603
3570	4822 117 13632	100k 5% 0,063W /22/34	4439	4822 051 30008	OR Jumper 0603
3600	4822 051 30102	1k 5% 0,062W	4440	4822 051 30008	OR Jumper 0603
3601	4822 051 30102	1k 5% 0,062W	4441	4822 051 30008	OR Jumper 0603
3602	4822 050 11002	1k 1% 0,4W	4442	4822 051 30008	OR Jumper 0603
3603	4822 051 30472	4k7 5% 0,062W	4443	4822 051 30008	OR Jumper 0603
3604	4822 051 30472	4k7 5% 0,062W	4444	4822 051 30008	OR Jumper 0603
3605	4822 051 30103	10k 5% 0,062W	4445	4822 051 30008	OR Jumper 0603
3800	4822 116 52283	4k7 5% 0,5W /21M	4446	4822 051 30008	OR Jumper 0603
3801	4822 051 30682	6k8 5% 0,062W /21M	4447	4822 051 30008	OR Jumper 0603
3802	4822 051 30103	10k 5% 0,062W /21M	4448	4822 051 30008	OR Jumper 0603
3803	4822 051 30103	10k 5% 0,062W /21M	4449	4822 051 30008	OR Jumper 0603
3804	4822 051 30272	2k7 5% 0,062W /21M	4450	4822 051 30008	OR Jumper 0603
3805	4822 051 30105	1M 5% 0,062W /21M	4451	4822 051 30008	OR Jumper 0603
3806	4822 051 30339	33R 5% 0,062W /21M	4452	4822 051 30008	OR Jumper 0603
3807	2120 366 90292	Potm Rotary 20k /21M	4453	4822 051 30008	OR Jumper 0603
3808	4822 051 30471	470R 5% 0,062W /21M	4454	4822 051 30008	OR Jumper 0603
3809	4822 051 30561	560R 5% 0,062W /21M	4455	4822 051 30008	OR Jumper 0603
3810	4822 051 30105	1M 5% 0,062W /21M	4456	4822 051 30008	OR Jumper 0603
3811	4822 051 30331	330R 5% 0,062W /21M	4457	4822 051 30008	OR Jumper 0603

## ELECTRICAL PARTS LIST - FRONT BOARD

## RESISTORS

4458	4822 051 30008	OR Jumper 0603
4459	4822 051 30008	OR Jumper 0603 /22/34
4460	4822 051 30008	OR Jumper 0603
4461	4822 051 30008	OR Jumper 0603
4462	4822 051 30008	OR Jumper 0603
4463	4822 051 30008	OR Jumper 0603
4464	4822 051 30008	OR Jumper 0603
4465	4822 051 30008	OR Jumper 0603
4466	4822 051 30008	OR Jumper 0603
4467	4822 051 30008	OR Jumper 0603
4468	4822 051 30008	OR Jumper 0603
4469	4822 051 30008	OR Jumper 0603
4470	4822 051 30008	OR Jumper 0603
4471	4822 051 30008	OR Jumper 0603
4472	4822 051 30008	OR Jumper 0603
4473	4822 051 30008	OR Jumper 0603
4474	4822 051 30008	OR Jumper 0603
4475	4822 051 30008	OR Jumper 0603
4476	4822 051 30008	OR Jumper 0603
4477	4822 051 30008	OR Jumper 0603
4478	4822 051 30008	OR Jumper 0603
4479	4822 051 30008	OR Jumper 0603
4480	4822 051 30008	OR Jumper 0603
4481	4822 051 30008	OR Jumper 0603
4482	4822 051 30008	OR Jumper 0603
4483	4822 051 30008	OR Jumper 0603
4484	4822 051 30008	OR Jumper 0603
4485	4822 051 30008	OR Jumper 0603
4486	4822 051 30008	OR Jumper 0603
4488	4822 051 30008	OR Jumper 0603
4490	4822 051 30008	OR Jumper 0603 /21M/30
4491	4822 051 30008	OR Jumper 0603 /21M/30
4601	4822 051 30008	OR Jumper 0603
4801	4822 051 30008	OR Jumper 0603 /21M/30
4802	4822 051 30008	OR Jumper 0603 /21M/30
4803	4822 051 30008	OR Jumper 0603 /21M/30
4804	4822 051 30008	OR Jumper 0603 /21M/30
4805	4822 051 30008	OR Jumper 0603 /21M/30
4806	4822 051 30008	OR Jumper 0603 /21M/30

## COILS &amp; FILTERS

5400	4822 157 62552	Coil 2,2µH 5%
5402	4822 242 72066	Ceram Resonator 8MHz /21M/22/34
5402	2422 540 98518	8M Hz CSTS*MG03 /30
5403	2422 543 01069	X'tal Resonator 32,768kHz
5404	4822 157 62552	Coil 2,2µH 5% /22/34
5405	4822 157 62552	Coil 2,2µH 5%
5600	4822 157 62552	Coil 2,2µH 5%
5601	4822 157 62552	Coil 2,2µH 5%
5602	4822 157 62552	Coil 2,2µH 5%
5800	4822 157 11235	Coil 22µH 5% /21M

## DIODES

6400	4822 130 31878	1N4003G
6401	4822 130 31878	1N4003G /22/34
6402	4822 130 31878	1N4003G
6404	4822 130 30621	1N4148
6405	4822 130 30621	1N4148
6406	4822 130 30621	1N4148
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148 /22/34
6420	4822 130 30621	1N4148
6422	9322 178 15676	LTL-8166FTNN
6423	9322 178 15676	LTL-8166FTNN
6424	9322 178 15676	LTL-8166FTNN
6425	9322 178 15676	LTL-8166FTNN
6426	4822 130 30621	1N4148 /22/34
6427	9322 179 76676	LTL-816EELC /22/34
6428	4822 130 30621	1N4148
6429	4822 130 30621	1N4148 /21M/30
6430	4822 130 30621	1N4148 /22/34
6600	4822 130 30621	1N4148

## TRANSISTORS &amp; INTEGRATED CIRCUITS

7400	3139 110 53221	TMP87CS71F "C355S53221"
7401	9352 679 67118	SAA6579T/V1/M4 /22/34
7402	9322 155 22667	IR Receive SOP2236ZC1
7403	9965 000 04931	M24C01-WMN6
7404	4822 130 60511	BC847B
7405	4822 130 60511	BC847B
7406	4822 130 60511	BC847B
7407	4822 130 60511	BC847B
7408	4822 130 60373	BC857B /22/34
7409	4822 130 60511	BC847B
7411	4822 130 60511	BC847B /21M
7600	4822 130 42804	BC817-25
7601	4822 130 42804	BC817-25
7602	4822 130 60373	BC857B
7800	4822 130 60511	BC847B /21M
7801	4822 130 60511	BC847B /21M

Note: Only the parts mentioned in this list are normal service spare parts.

---

# MAINS BOARD

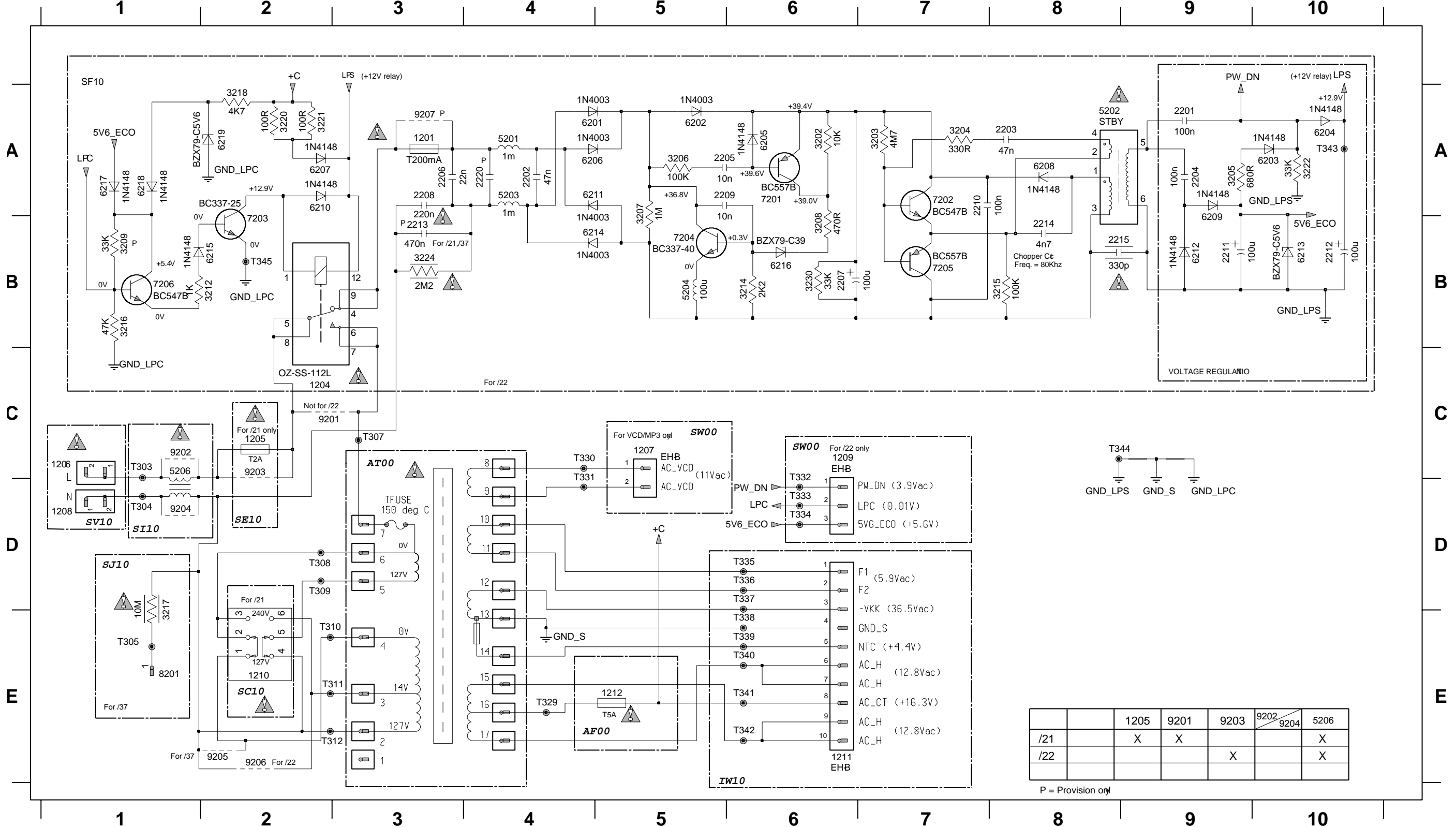
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# MAINS CIRCUIT

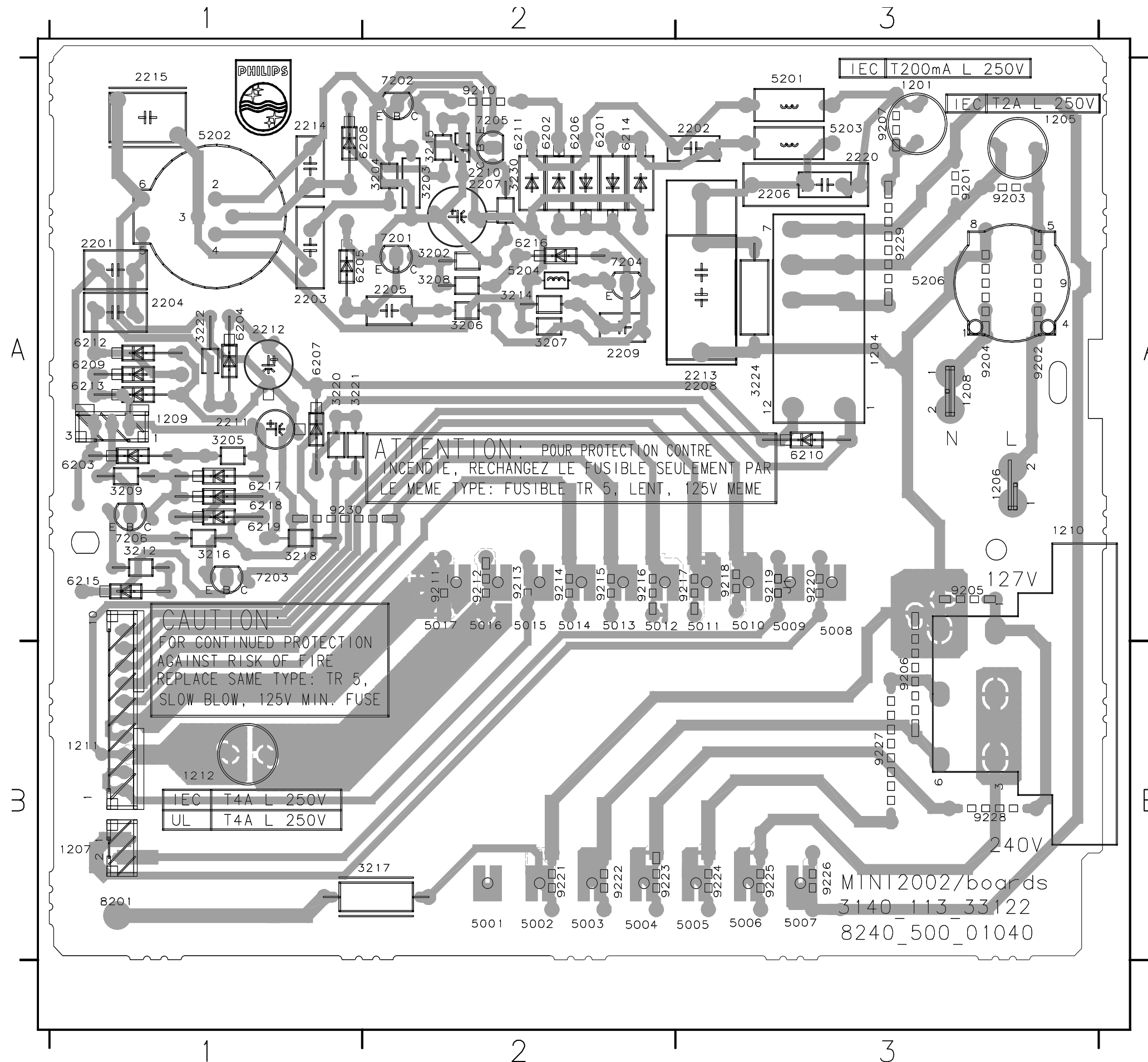
1201 A3	1208 D1	2201 A9	2206 A3	2211 B9	2220 A4	3206 A5	3214 B6	3220 A2	5201 A4	6201 A4	6206 A4	6211 A4	6216 B6	7202 A7	8201 E1	9205 E2	T305 E1	T311 E3	T332 D6	T337 D6	T342 E6
1204 C2	1209 C6	2202 A4	2207 B6	2212 B10	3202 A6	3207 A5	3215 B8	3221 A2	5202 A8	6202 A5	6207 A2	6212 B9	6217 A1	7203 B2	9201 C2	9206 E2	T307 C3	T312 E2	T333 D6	T338 E6	T343 A10
1205 C2	1210 E2	2203 A8	2208 A3	2213 B3	3203 A7	3208 B6	3216 B1	3222 A10	5203 A4	6203 A10	6208 A8	6213 B10	6218 A1	7204 B5	9202 C1	9207 A3	T308 D2	T329 E4	T334 D6	T339 E6	T344 C8
1206 C1	1211 E6	2204 A9	2209 A5	2214 B8	3204 A7	3209 B1	3217 D1	3224 B3	5204 B5	6204 A10	6209 A9	6214 B4	6219 A2	7205 B7	9203 C2	T303 C1	T309 D2	T330 C4	T335 D6	T340 E6	T345 B2
1207 C5	1212 E5	2205 A5	2210 A7	2215 B8	3205 A9	3212 B2	3218 A2	3230 B6	5206 C1	6205 A6	6210 A2	6215 B2	7201 A6	7206 B1	9204 D1	T304 D1	T310 E2	T331 D4	T336 D6	T341 E6	



	1205	9201	9203	9202/9204	5206
/21	X	X			X
/22			X		X

P = Provision onl

# COMPONENT LAYOUT



J1	A3	6201	A2
1201	A3	6202	A2
1204	A3	6203	A1
1205	A3	6204	A1
1206	A3	6205	A1
1207	B1	6206	A2
1208	A3	6207	A1
1209	A1	6208	A2
1210	A3	6209	A1
1211	B1	6210	A3
1212	B1	6211	A2
2201	A1	6212	A1
2202	A3	6213	A1
2203	A1	6214	A2
2204	A1	6215	A1
2205	A2	6216	A2
2206	A3	6217	A1
2207	A2	6218	A1
2208	A3	6219	A1
2209	A2	7201	A2
2210	A2	7202	A2
2211	A1	7203	A1
2212	A1	7204	A2
2213	A3	7205	A2
2214	A1	7206	A1
2215	A1	8201	B1
2220	A3	9201	A3
3202	A2	9202	A3
3203	A2	9203	A3
3204	A2	9204	A3
3205	A1	9205	A3
3206	A2	9206	B3
3207	A2	9207	A3
3208	A2	9210	A2
3209	A1	9211	A2
3212	A1	9212	A2
3214	A2	9213	A2
3215	A2	9214	A2
3216	A1	9215	A2
3217	B2	9216	A2
3218	A1	9217	A3
3220	A1	9218	A3
3221	A1	9219	A3
3222	A1	9220	A3
3224	A3	9221	B2
3230	A2	9222	B2
5001	B2	9223	B2
5002	B2	9224	B3
5003	B2	9225	B3
5004	B2	9226	B3
5005	B3	9227	B3
5006	B3	9228	B3
5007	B3	9229	A3
5008	A3	9230	A1
5009	A3		
5010	A3		
5011	A3		
5012	A2		
5013	A2		
5014	A2		
5015	A2		
5016	A2		
5017	A2		
5201	A3		
5202	A1		
5203	A3		
5204	A2		
5206	A3		

MINI2002/boards  
 3140\_113\_33122  
 8240\_500\_01040

**ELECTRICAL PARTSLIST - MAINS BOARD****- MISCELLANEOUS -**

1201  $\Delta$  4822 071 52001 FUSE 19372(200MA) /22/34  
 1204  $\Delta$  2422 132 07519 RELAY 1P 12V 16A /22/34  
 1205  $\Delta$  9965 000 07788 FUSE RAD T2A IEC UL250V /21M  
 1210  $\Delta$  2422 129 16478 VOLTSEL 2P 5A /21M  
 1212  $\Delta$  9965 000 07786 FUSE RAD T4.0A IEC UL250V

5202  $\Delta$  2422 549 45157 TRAFO STANDBY /22/34  
 5206 4822 157 11832 400UH 3A

**- CAPACITORS -**

2201 5322 121 42386 100NF 5% 63V /22/34  
 2202 4822 121 43526 47NF 5% 250V /22/34  
 2203 4822 126 14559 47NF -80/+20% 50V /22/34  
 2204 5322 121 42386 100NF 5% 63V /22/34  
 2205 4822 122 30043 10NF 80% 63V /22/34  
  
 2206 4822 121 41856 22NF 5% 250V /22/34  
 2207 4822 124 40255 100UF 20% 63V /22/34  
 2208 4822 121 10512 275V 220N 20% /22/34  
 2209 4822 122 30043 10NF 80% 63V /22/34  
 2210 2020 561 90365 CER2 Y5V 50V 100N /22/34  
  
 2211 4822 124 41584 100UF 20% 10V /22/34  
 2212 4822 124 40207 100UF 20% 25V /22/34  
 2214 5322 122 32261 4,7NF 10% X7R 100V /22/34  
 2215  $\Delta$  2020 554 90168 CERSAF 250V 330P 10% /22/34

**- RESISTORS -**

3202 4822 050 21003 10K00 1% 0,6W /22/34  
 3203 4822 050 24705 4M70 1% 0,6W /22/34  
 3204 4822 116 52219 330E 5% 0,5W /22/34  
 3205 4822 116 52228 680E 5% 0,5W /22/34  
 3206 4822 116 52234 100K 5% 0,5W /22/34  
  
 3207 4822 116 83866 1M 5% 0,5W /22/34  
 3208 4822 116 83883 470R 5% 0,5W /22/34  
 3212 4822 050 11002 1K00 1% 0,4W /22/34  
 3214 4822 116 52256 2K2 5% 0,5W /22/34  
 3215 4822 116 52234 100K 5% 0,5W /22/34  
  
 3216 4822 116 83884 47K 5% 0,5W /22/34  
 3218 4822 116 52283 4K7 5% 0,5W /22/34  
 3220 4822 116 52175 100E 5% 0,5W /22/34  
 3221 4822 116 52175 100E 5% 0,5W /22/34  
 3222 4822 050 23303 33K00 1% 0,6W /22/34  
  
 3224  $\Delta$  4822 053 21225 2M20 5% 0,5W /22/34  
 3230 4822 050 23303 33K00 1% 0,6W /22/34

**- COILS & FILTERS -**

5201 4822 157 53473 1000UH 10% 4X9,8 /22/34

**- COILS & FILTERS -**

5203 4822 157 53473 1000UH 10% 4X9,8 /22/34  
 5204 4822 157 11228 100UH LAN02TB101J 5% /22/34  
 5206 4822 157 11832 400UH 3A /22/34

**- DIODES -**

6201 4822 130 31878 1N4003G /22/34  
 6202 4822 130 31878 1N4003G /22/34  
 6203 4822 130 30621 1N4148 /22/34  
 6204 4822 130 30621 1N4148 /22/34  
 6205 4822 130 30621 1N4148 /22/34  
  
 6206 4822 130 31878 1N4003G /22/34  
 6207 4822 130 30621 1N4148 /22/34  
 6208 4822 130 30621 1N4148 /22/34  
 6209 4822 130 30621 1N4148 /22/34  
 6210 4822 130 30621 1N4148 /22/34  
  
 6211 4822 130 31878 1N4003G /22/34  
 6212 4822 130 30621 1N4148 /22/34  
 6213 4822 130 34173 BZX79-C5V6 /22/34  
 6214 4822 130 31878 1N4003G /22/34  
 6215 4822 130 30621 1N4148 /22/34  
  
 6216 4822 130 34145 BZX79-B39 /22/34  
 6217 4822 130 30621 1N4148 /22/34  
 6218 4822 130 30621 1N4148 /22/34  
 6219 4822 130 34173 BZX79-C5V6 /22/34

**- IC & TRANSISTORS -**

7201 4822 130 44568 BC557B /22/34  
 7202 4822 130 40959 BC547B /22/34  
 7203 4822 130 40981 BC337-25 /22/34  
 7204 4822 130 40855 BC337 /22/34  
 7205 4822 130 44568 BC557B /22/34  
  
 7206 4822 130 40959 BC547B /22/34

**Note :** Only the parts mentioned in this list are normal service spare parts.



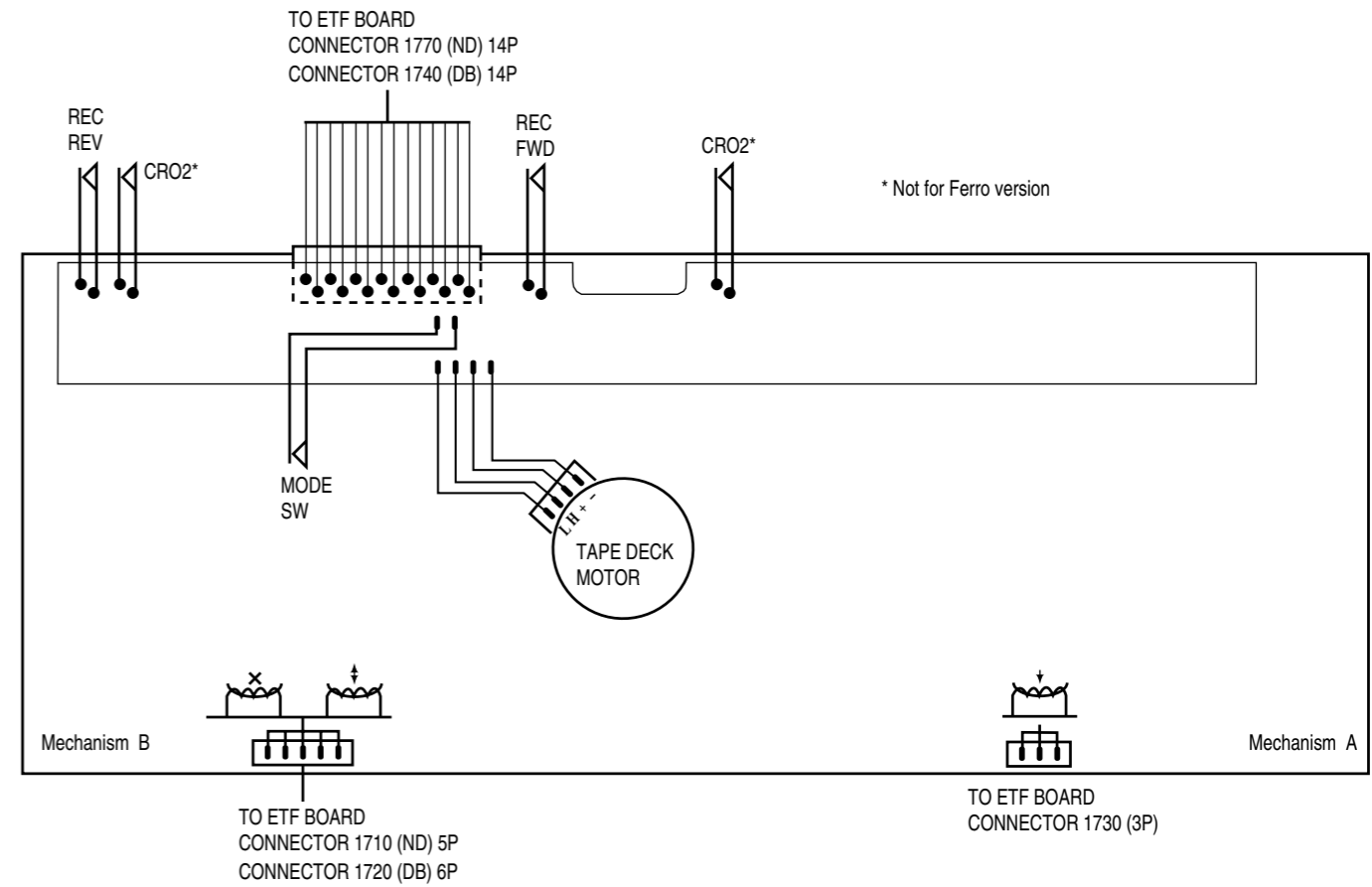
# ETF7 TAPE MODULE

## (Non-Dolby Version)

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### Tapedeck wiring (Double deck)

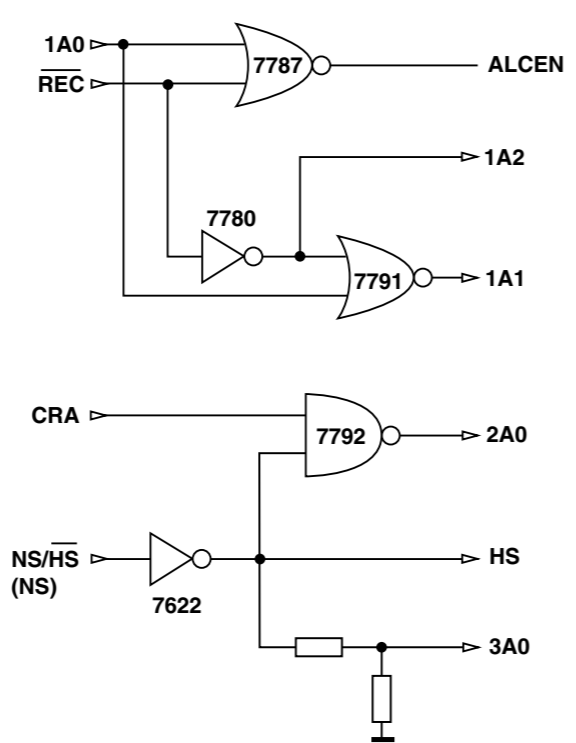
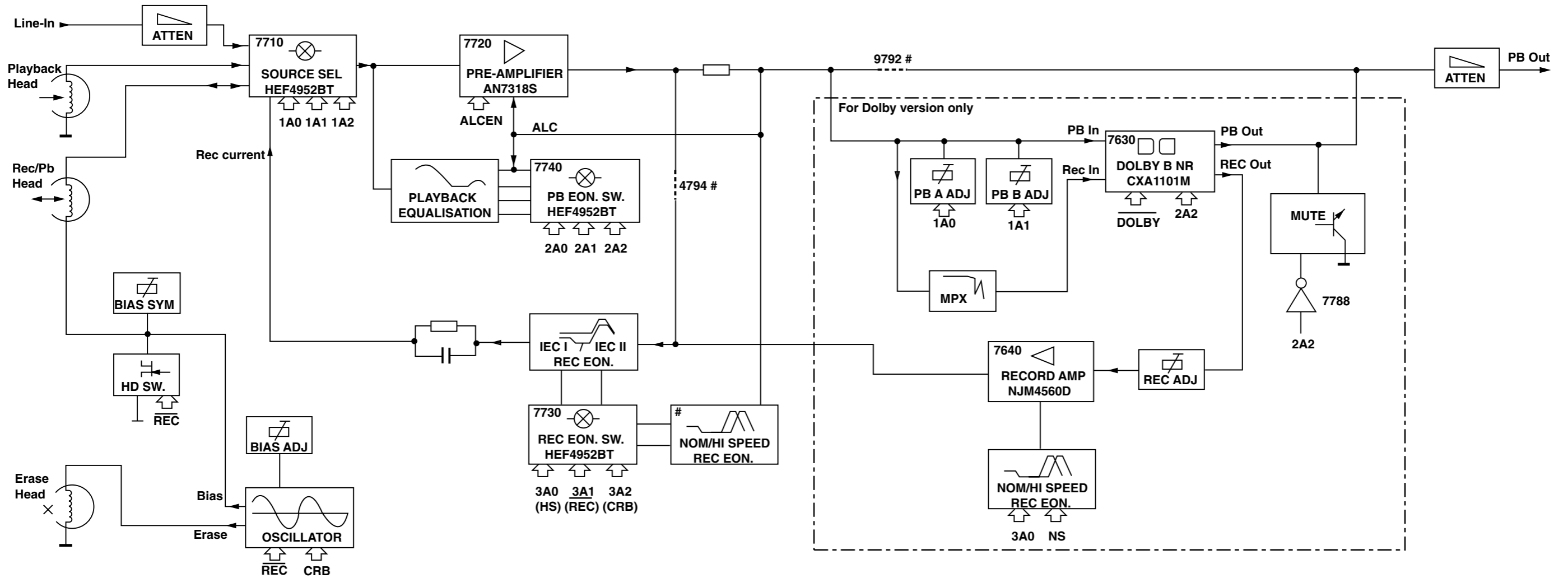


### Variations table for Analog Circuit

	Autoreverse	Non-autoreverse	
	ND/DD/FR	ND/DD/FR	ND/DD/FF
	Chrome/Ferro	Chrome/Ferro	Ferro
2624	-	-	100nF
2701 , 2702	150pF	270pF	270pF
2703 , 2704	100pF	220pF	220pF
2717 , 2718	10nF	15nF	15nF
2721 , 2722	6,8nF	6,8nF	-
2727 , 2728	470pF	1nF	1nF
3616	10k	1k	1k
3618	6k8	-	-
3620	10k trimmer	-	-
3622	-	10k trimmer	10k trimmer
3672	4k7	-	-
3676	47k	-	-
3687	220R	220R	-
3688	680R	-	-
3723 , 3724	15k	18k	18k
3725 , 3726	10R	10R	-
3727 , 3728	5k6	6k8	6k8
3729 , 3730	3k3	4k7	4k7
3743 , 3744	1k5	2k2	2k2
3745 , 3746	3k3	5k6	5k6
3754 , 3755	1M	47R	47R

	Autoreverse	Non-autoreverse	
	ND/DD/FR	ND/DD/FR	ND/DD/FF
	Chrome/Ferro	Chrome/Ferro	Ferro
3769	12k	8k2	8k2
3772	6k8	5k6	5k6
4785	-	-	OR jumper
3774	15k	8k2	8k2
6614	1N4148	-	-
7616	BC857B	-	-
7622	BC847B	-	-

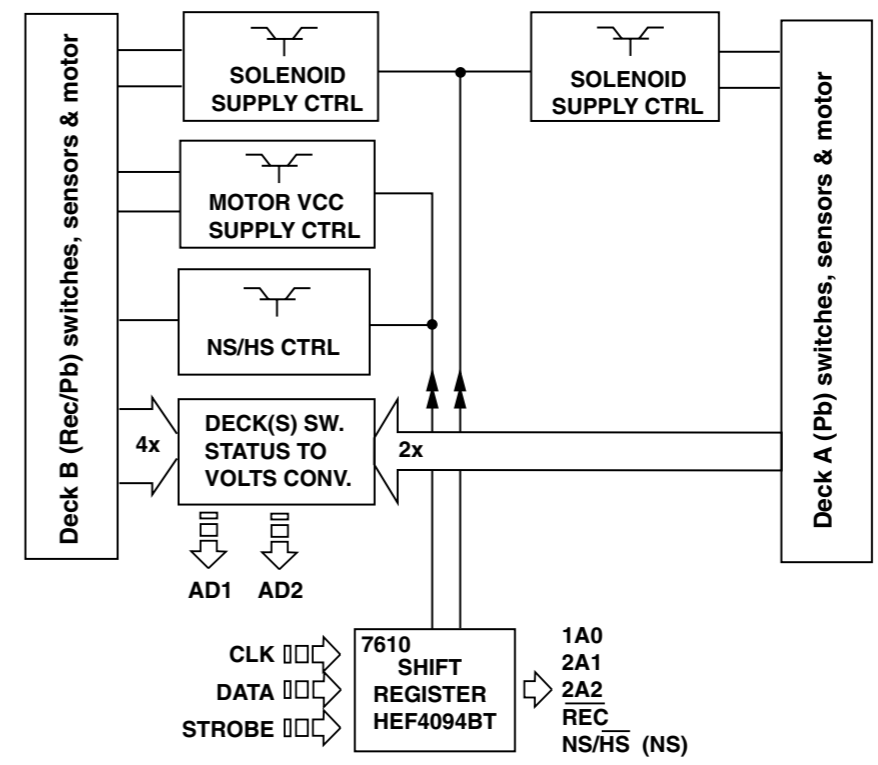
**BLOCK DIAGRAM**



NOTE: # For Non-dolby version only  
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers



## Brief introduction

### General

1. Playback Mode  
Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.
2. Recording Mode  
Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.
3. Dubbing Mode  
In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.
4. Mode Selector  
The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.
5. Amplifier PB/REC  
Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.
6. Automatic Level Control (ALC)  
ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762, 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.
7. Muting Circuit (For Non-Dolby version only)  
Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.
8. IC7740 (HEF4952BT)  
The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.
9. IC7730 (HEF4952BT)  
The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).
10. Bias Level  
Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.
11. Bias Symm (For Dolby B NR version only)  
Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.
12. PB Switch  
Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)  
During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.
14. IC7610 (HEF4094BT)  
IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL\_A, SOL\_B and MOT. Recording speed is controlled via NS/HS.

### Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)  
IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by  $\overline{DOLBY}$ , which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.
16. 19kHz Filter  
The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.
17. Level Adjust  
The Variable resistor 3635, 3636, 3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz, 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.
18. Amplifier IC7640 (NJM4560M)  
The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.
19. Muting Circuit  
The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

### NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

**CONNECTORS ASSIGNMENTS:****CONNECTOR 1701****INTERCONNECTION TO AF BOARD**

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) for AF electronics
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

**CONNECTOR 1703****INTERCONNECTION TO AF BOARD**

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

**CONNECTOR 1706****INTERCONNECTION TO FRONT BOARD**

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5V	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

**CONNECTOR 1710****DECK B HEADS CONNECTON (For Non-Dolby version only)**

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

**CONNECTOR 1720****DECK B HEADS CONNECTON (For Dolby B NR version only)**

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

**CONNECTOR 1730****DECK A HEAD CONNECTIONS (For Double Deck versions only)**

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

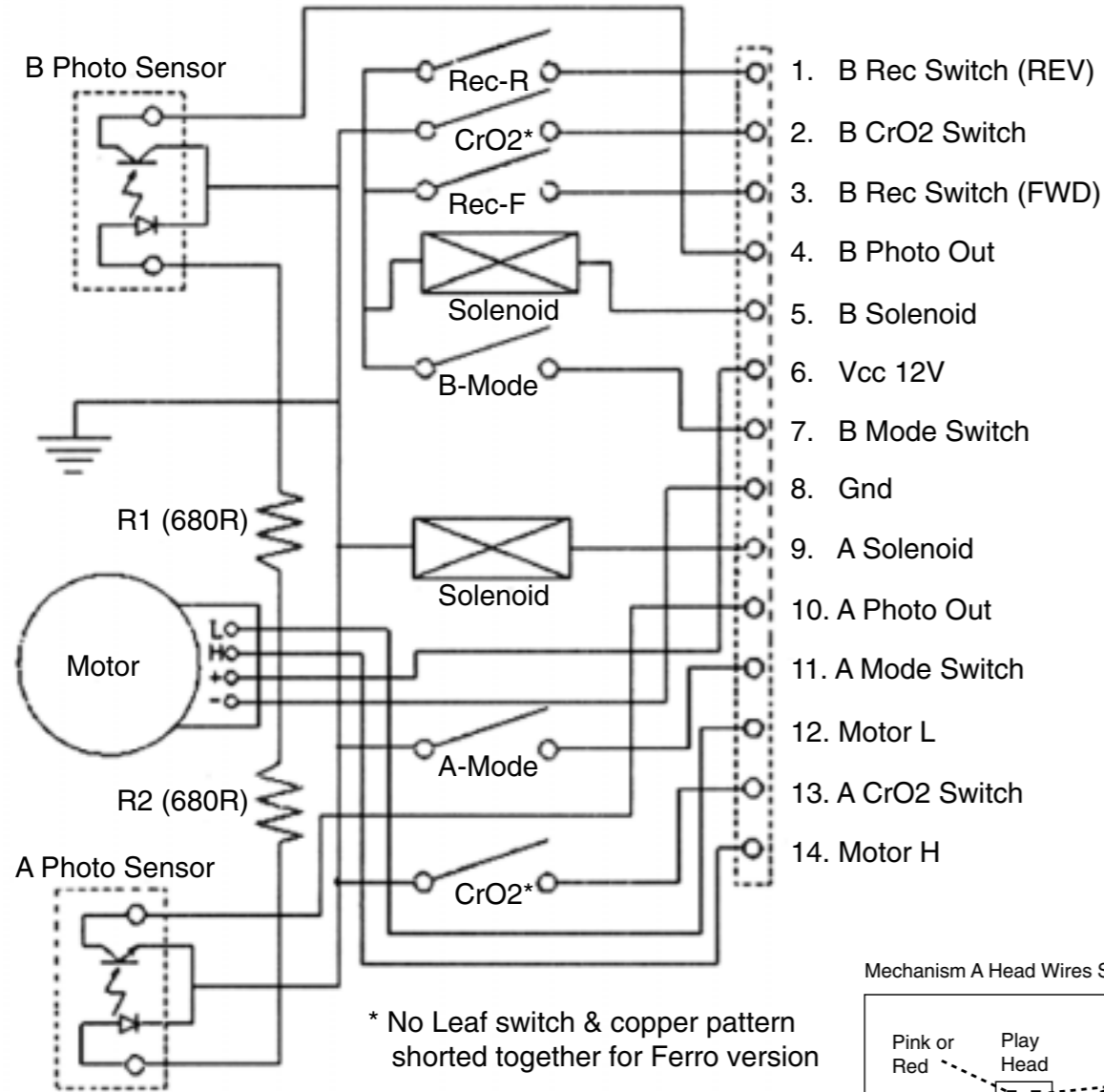
**CONNECTOR 1740****DECK A & B CONTROL INTERFACE (For Dolby B NR version only)**

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	SOL A	Solenoid supply for deck A	
○	10	PHOTO A	Photo sensor output (tape movement indication)	
○	11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○	12	L	L pin for motor	
○	13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	14	H	H pin for motor	

**CONNECTOR 1770****DECK A & B CONTROL INTERFACE (For Non-Dolby version only)**

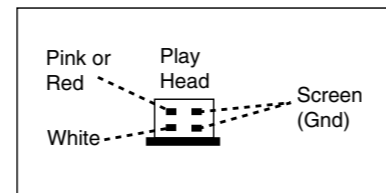
○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	SOL A	Solenoid supply for deck A	
○	10	PHOTO A	Photo sensor output (tape movement indication)	
○	11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
○	12	L	L pin for motor	
○	13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	14	H	H pin for motor	

TAPE MECHANISM ELECTRONICS

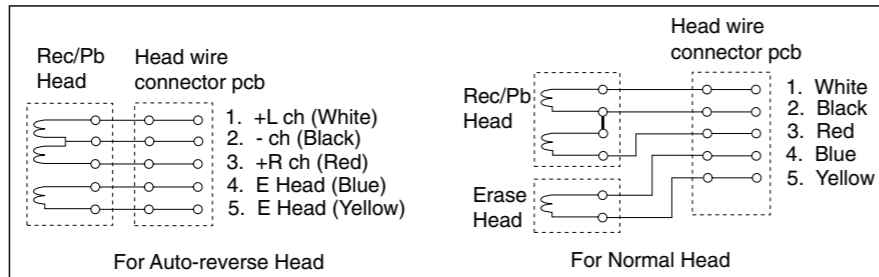


\* No Leaf switch & copper pattern shorted together for Ferro version

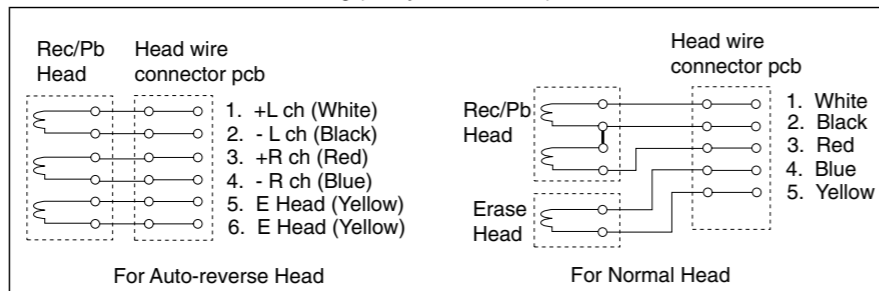
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)



TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
<b>ADJUST MOTOR SPEED</b>						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2	frequency counter	3620	3150Hz +/- 0.5%
		PLAY A	LEFT RIGHT		check	3150Hz -0.8/+1.8%
<b>CHECK WOW &amp; FLUTTER</b>						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2	W&F-meter	check	<0.4 % DIN
<b>ADJUST AZIMUTH</b>						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #	LEFT RIGHT		right hand screw	
<b>CHECK PLAYBACK FREQUENCY RESPONSE</b>						
DECK A & B	SBC420	PLAY	1 or 2	mV-meter	check	limits see fig.1
<b>ADJUST BIAS CURRENT</b>						
DECK B	SBC419A^	RECORD	5 or 6	mV-meter	3773	995mV
	SBC420		LEFT RIGHT		check	750mV +/- 1.5dB
<b>CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION</b>						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2	THD-meter	check	<3% *

SBC419A^ : 4822 397 30069  
SBC420 : 4822 397 30071

# For Auto-reverse version only  
\* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-measure  
^ Not applicable for Ferro version

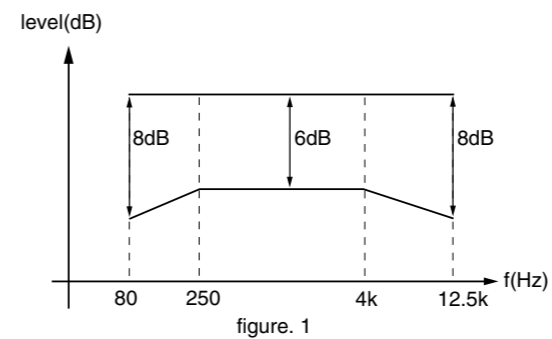


figure. 1

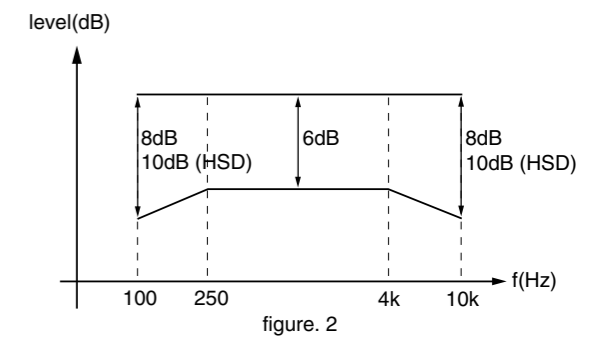
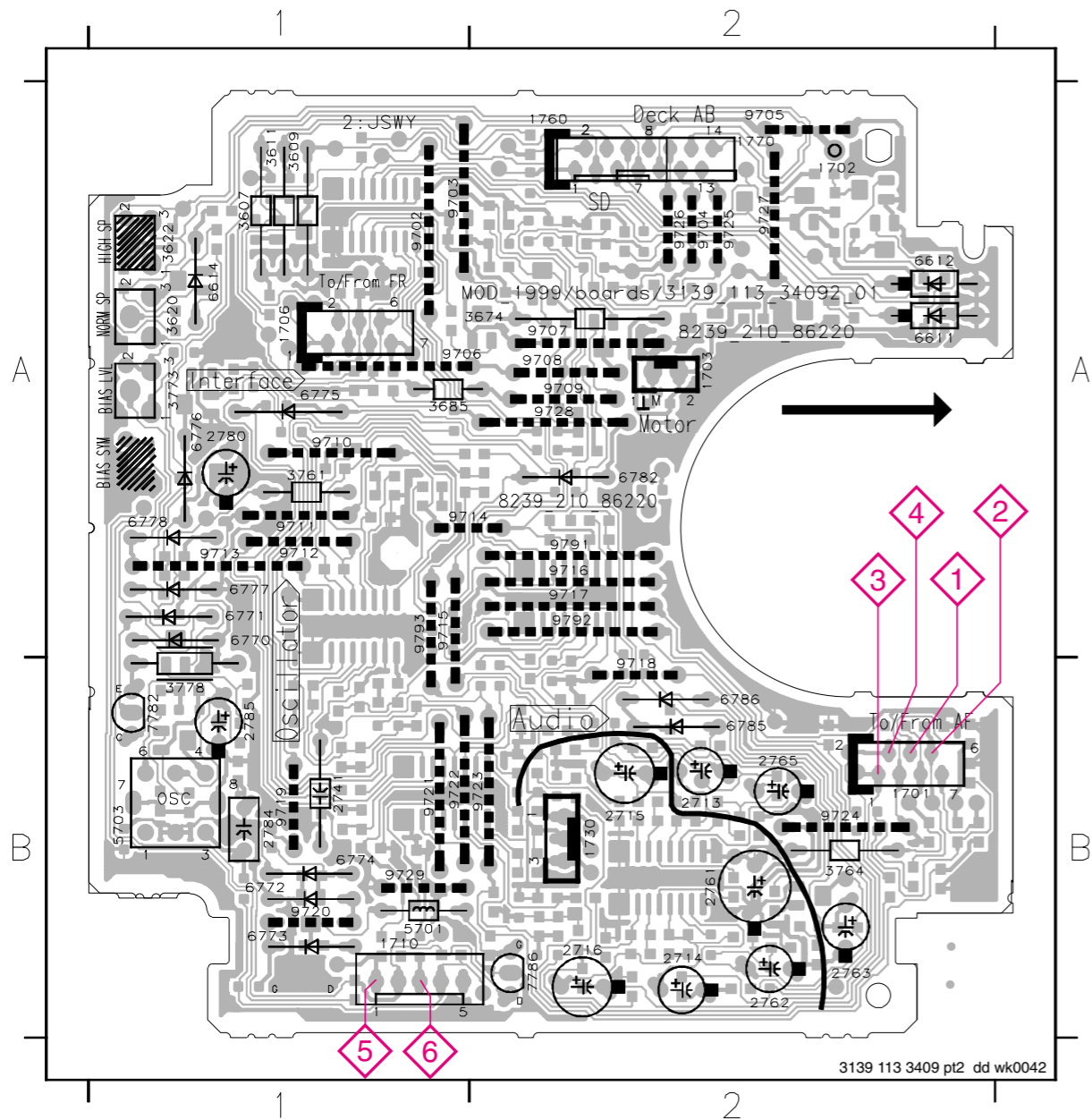


figure. 2

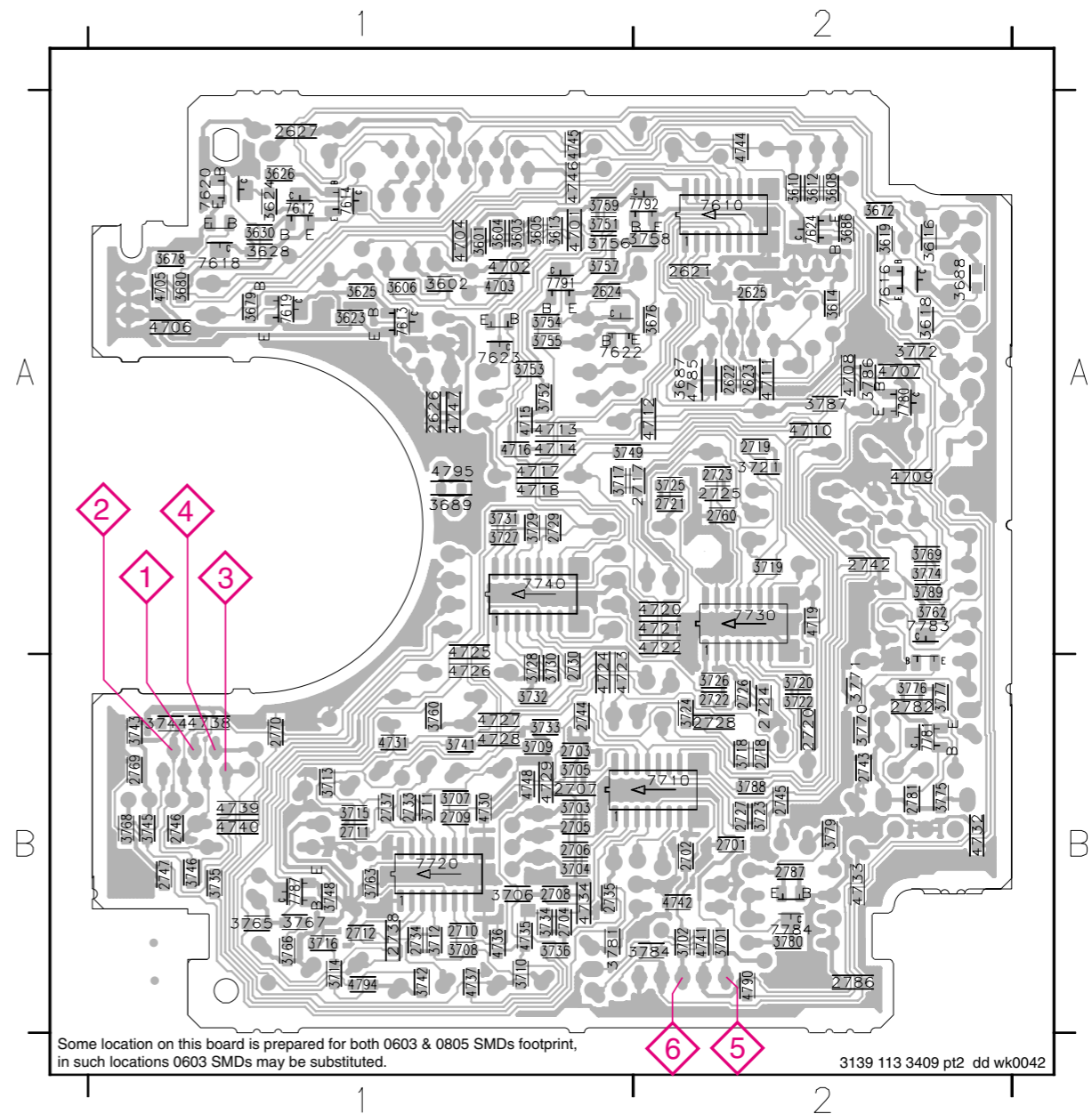
# COMPONENT LAYOUT

1701 B2	2714 B2	2784 B1	3761 A1	6770 A1	6782 A2	9706 A1	9715 A1	9724 B2
1702 A2	2715 B2	2785 B1	3764 B2	6771 A1	6785 B2	9707 A2	9716 A2	9725 A2
1703 A2	2716 B2	3607 A1	3773 A1	6772 B1	6786 B2	9708 A2	9717 A2	9726 A2
1706 A1	2741 B1	3609 A1	3778 B1	6773 B1	7782 B1	9709 A2	9718 B2	9727 A2
1710 B1	2761 B2	3611 A1	5701 B1	6774 B1	7786 B2	9710 A1	9719 B1	9728 A2
1730 B2	2762 B2	3620 A1	5703 B1	6775 A1	9702 A1	9711 A1	9720 B1	9729 B1
1760 A2	2763 B2	3622 A1	6611 A2	6776 A1	9703 A1	9712 A1	9721 B1	9791 A2
1770 A2	2765 B2	3674 A2	6612 A2	6777 A1	9704 A2	9713 A1	9722 B1	9792 A2
2713 B2	2780 A1	3685 A1	6614 A1	6778 A1	9705 A2	9714 A1	9723 B2	9793 A1



# CHIP LAYOUT

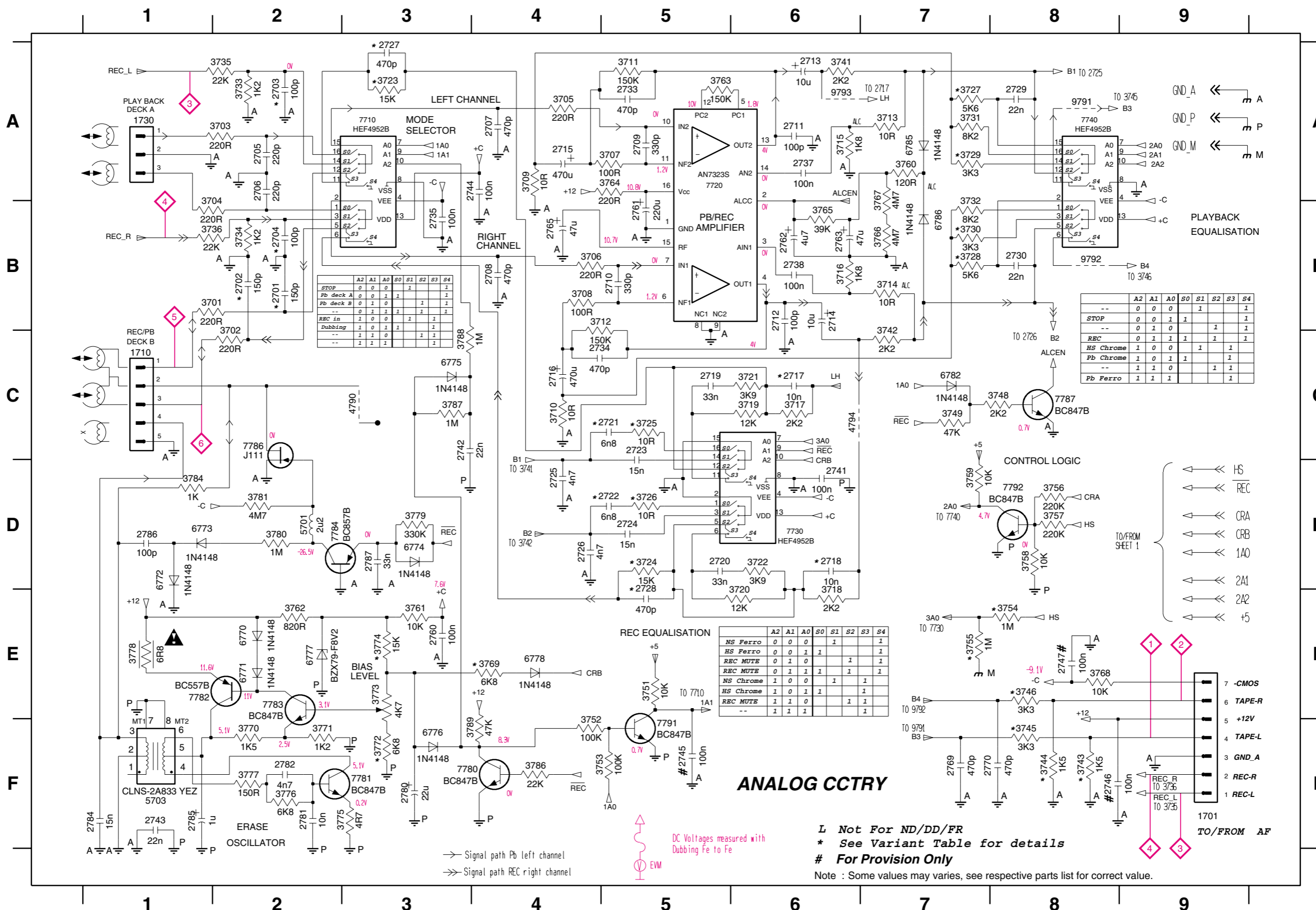
2621 A2	2724 B2	3602 A1	3688 A2	3725 A2	3757 A1	4701 A1	4727 B1	7612 A1
2622 A2	2725 A2	3603 A1	3689 A1	3726 B2	3758 A2	4702 A1	4728 B1	7613 A1
2623 A2	2726 B2	3604 A1	3701 B2	3727 B1	3759 A1	4703 A1	4729 B1	7614 A1
2624 A1	2727 B2	3605 A1	3702 B2	3728 B1	3760 B1	4704 A1	4730 B1	7616 A2
2625 A2	2728 B2	3606 A2	3703 B1	3729 A1	3762 A2	4705 A1	4731 B1	7618 A1
2626 A1	2729 A1	3608 A2	3704 B1	3730 B1	3763 B1	4706 A1	4732 B2	7619 A1
2627 A1	2730 B1	3610 A2	3705 B1	3731 A1	3765 B1	4707 A2	4733 B2	7620 A1
2701 B2	2733 B1	3612 A2	3706 B1	3732 B1	3766 B1	4708 A2	4734 B1	7622 A1
2702 B2	2734 B1	3613 A1	3707 B1	3733 B1	3767 B1	4709 A2	4735 B1	7623 A1
2703 B1	2735 B1	3614 A2	3708 B1	3734 B1	3768 B1	4710 A2	4736 B1	7624 A2
2704 B1	2737 B1	3616 A2	3709 B1	3735 B1	3769 A2	4711 A2	4737 B1	7710 B2
2705 B1	2738 B1	3618 A2	3710 B1	3736 B1	3770 B2	4712 A2	4738 B1	7720 B1
2706 B1	2742 A2	3619 A2	3711 B1	3741 B1	3771 B2	4713 A1	4739 B1	7730 A2
2707 B1	2743 B2	3623 A1	3712 B1	3742 B1	3772 A2	4714 A1	4740 B1	7740 A1
2708 B1	2744 B1	3624 A1	3713 B1	3743 B1	3774 A2	4715 A1	4741 B2	7780 A2
2709 B1	2745 B2	3625 A1	3714 B1	3744 B1	3775 B2	4716 A1	4742 B2	7781 B2
2710 B1	2746 B1	3626 A1	3715 B1	3745 B1	3776 B2	4717 A1	4744 A2	7783 A2
2711 B1	2747 B1	3628 A1	3716 B1	3746 B1	3777 B2	4718 A1	4745 A1	7784 B2
2712 B1	2760 A2	3630 A2	3717 A1	3748 B1	3779 B2	4719 A2	4746 A1	7787 B1
2717 A2	2769 B1	3672 A2	3718 B2	3749 A1	3780 B2	4720 A2	4747 A1	7791 A1
2718 B2	2770 B1	3676 A2	3719 A2	3751 A1	3781 B1	4721 A2	4748 B1	7792 A2
2719 A2	2781 B2	3678 A1	3720 B2	3752 A1	3784 B2	4722 A2	4785 A2	
2720 B2	2782 B2	3679 A1	3721 A2	3753 A1	3786 A2	4723 B1	4790 B2	
2721 A2	2786 B2	3680 A1	3722 B2	3754 A1	3787 A2	4724 B1	4794 B1	
2722 B2	2787 B2	3686 A2	3723 B2	3755 A1	3788 B2	4725 A1	4795 A1	
2723 A2	3601 A1	3687 A2	3724 B2	3756 A1	3789 A2	4726 B1	7610 A2	





ANALOG CIRCUIT

1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	6788 B7	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	6789 B7	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	

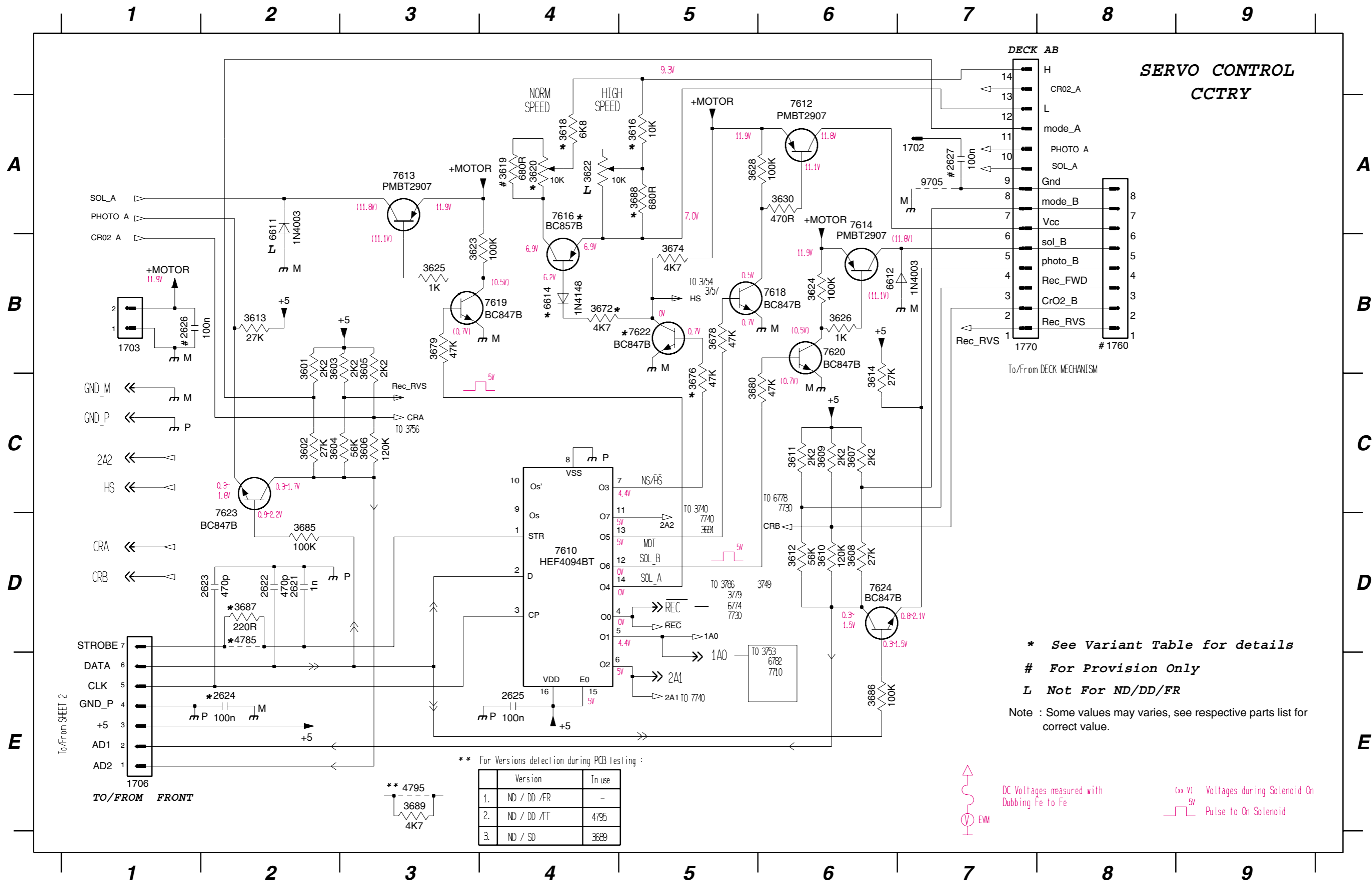


ANALOG CCTRY

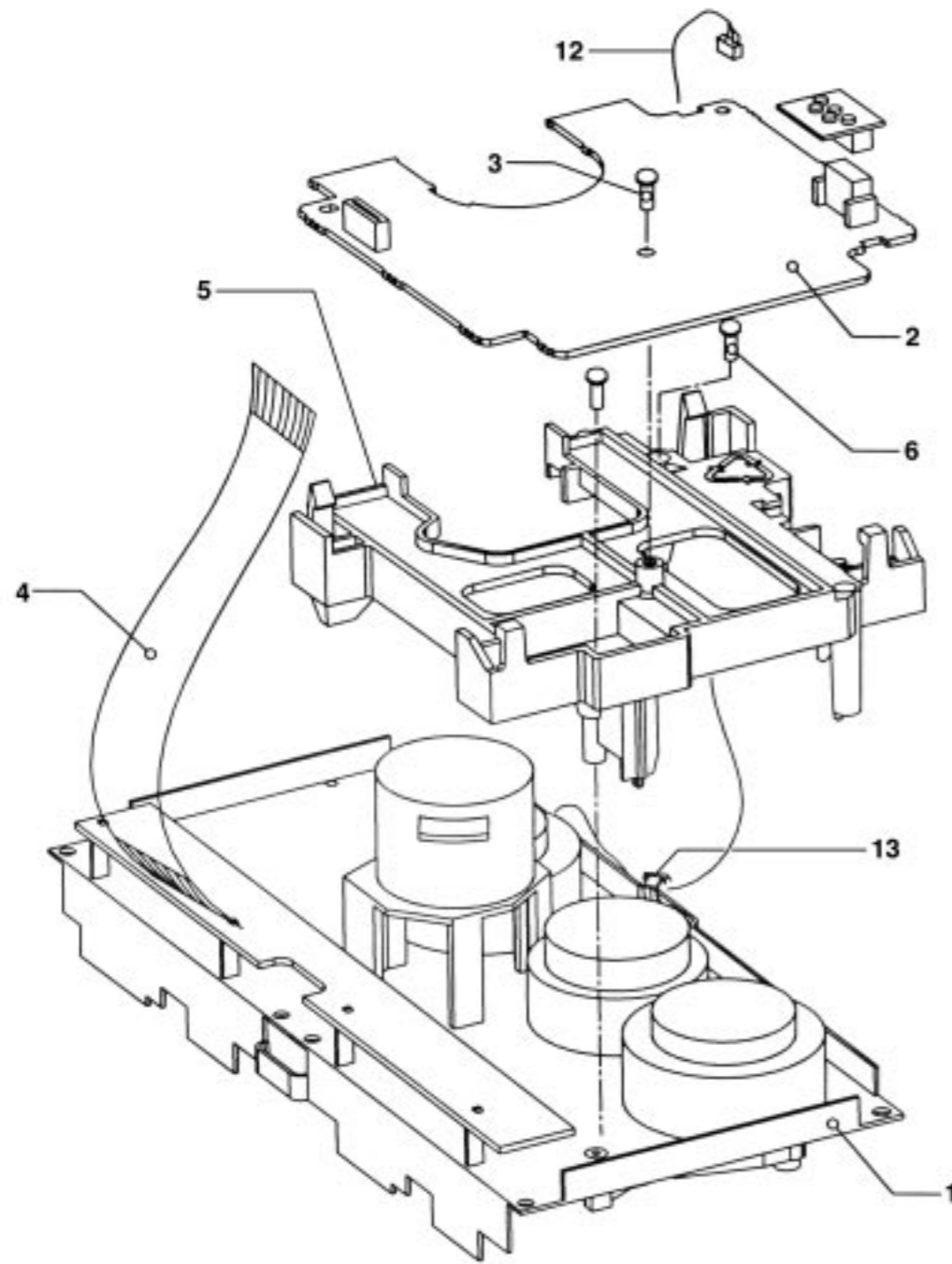
L Not For ND/DD/FR  
 \* See Variant Table for details  
 # For Provision Only  
 Note : Some values may varies, see respective parts list for correct value.

# SERVO CONTROL CIRCUIT

1702 A7	1760 B8	2622 D2	2625 E4	3601 B2	3604 C2	3607 C6	3610 D6	3613 B2	3618 A4	3622 A4	3625 B3	3630 A6	3676 C5	3680 C5	3687 D2	4785 D2	6612 B6	7612 A6	7616 A4	7620 B6	7624 D6
1703 B1	1770 B7	2623 D2	2626 B1	3602 C2	3605 B3	3608 D6	3611 C6	3614 C6	3619 A4	3623 B3	3626 B6	3672 B4	3678 B5	3685 D2	3688 A5	4795 E3	6614 B4	7613 A3	7618 B6	7622 B5	9705 A7
1706 E1	2621 D2	2624 E2	2627 A7	3603 B2	3606 C3	3609 C6	3612 D6	3616 A5	3620 A4	3624 B6	3628 A5	3674 B5	3679 B3	3686 E6	3689 E3	6611 A2	7610 D4	7614 A6	7619 B4	7623 D2	





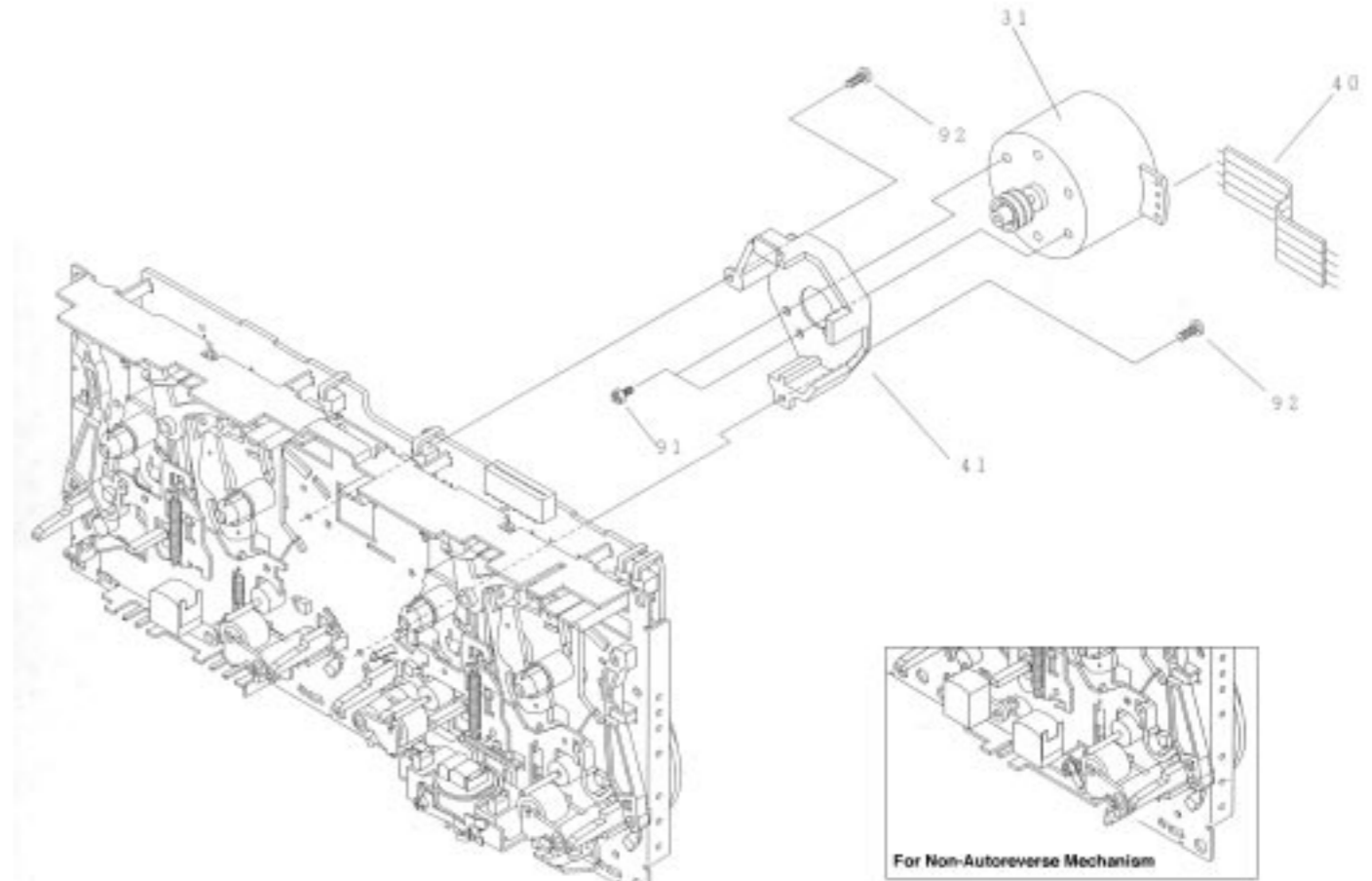


3139 118 77070 (incl. ...77080) dd wk926

**TAPE MODULE EXPLODED VIEW**

- 1 3139 118 77130 Autoreverse Mech. CWE44FR01
- 1 3139 118 77140 Non-Autoreverse Mech. CWE44FF02 Chrome/Ferro
- 1 3139 118 77950 Non-Autoreverse Mech. CWE44FF05 Ferro
- 3 - Screw D3 x 10
- 6 - Screw M2 x 16
- 7 3139 110 34080 Flex Cable 14 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.



**TAPE MECHANISM - MOTOR EXPLODED VIEW**

- 31 4822 361 11055 Motor Assembly
- 91 - Screw M2,6 x 5
- 92 - Screw M2 x 5

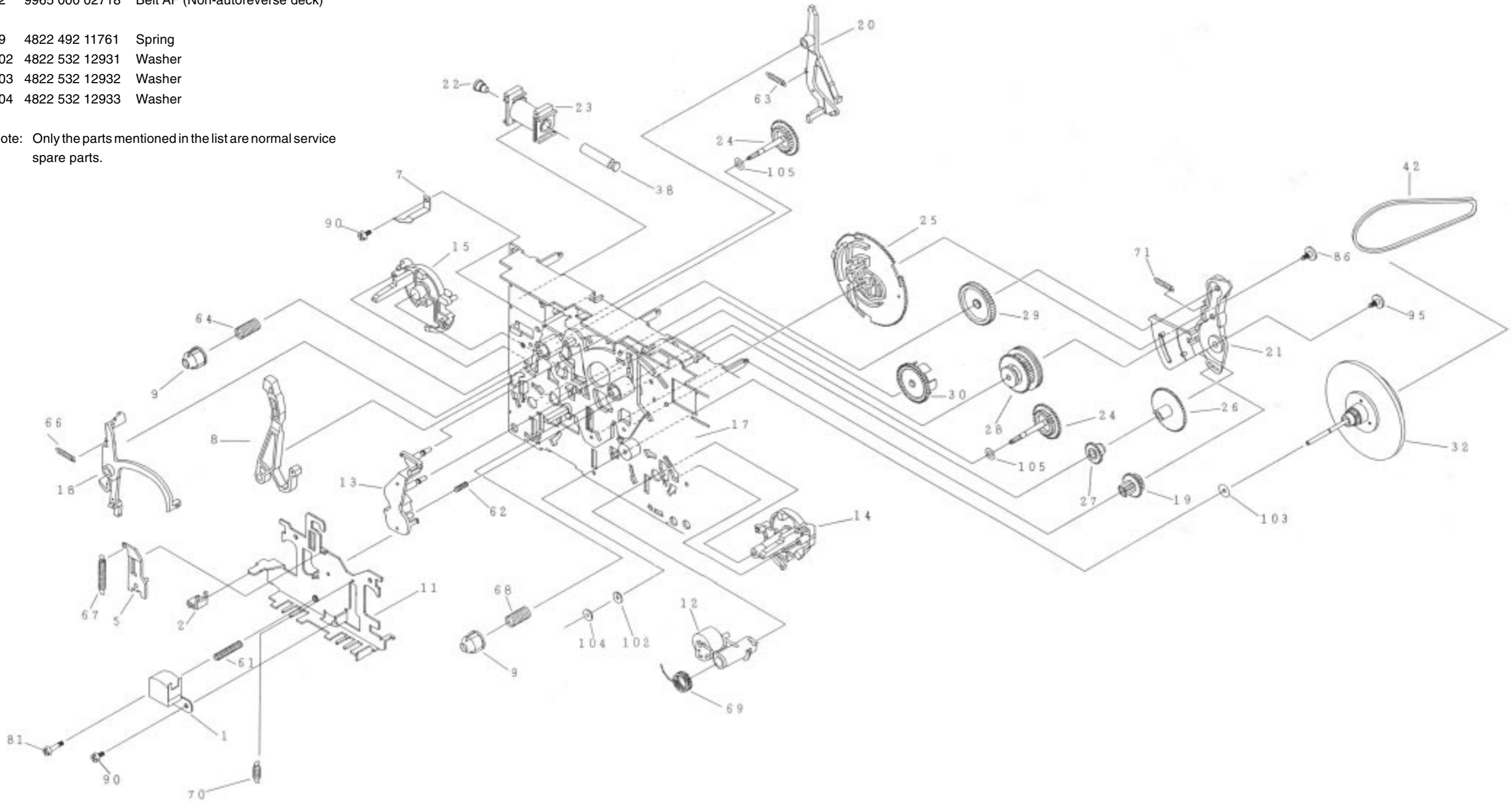
Note: Only the parts mentioned in this list are normal service spare parts.

**TAPE MECHANISM A - PLAY**

***MECHANICAL PARTS - PLAY MECHANISM***

- 1 9965 000 02313 Play Head (Non-Autoreverse deck)
- 1 9965 000 02321 Play Head (Autoreverse deck)
- 12 4822 402 10972 Pinch Arm Assembly R
- 23 9965 000 02314 Coil Assembly
  
- 25 9965 000 06443 Cam Gear
- 32 4822 528 11209 Flywheel Assembly RV
- 42 9965 000 02315 Belt AF (Autoreverse deck)
- 42 9965 000 02718 Belt AF (Non-autoreverse deck)
  
- 69 4822 492 11761 Spring
- 102 4822 532 12931 Washer
- 103 4822 532 12932 Washer
- 104 4822 532 12933 Washer

Note: Only the parts mentioned in the list are normal service spare parts.

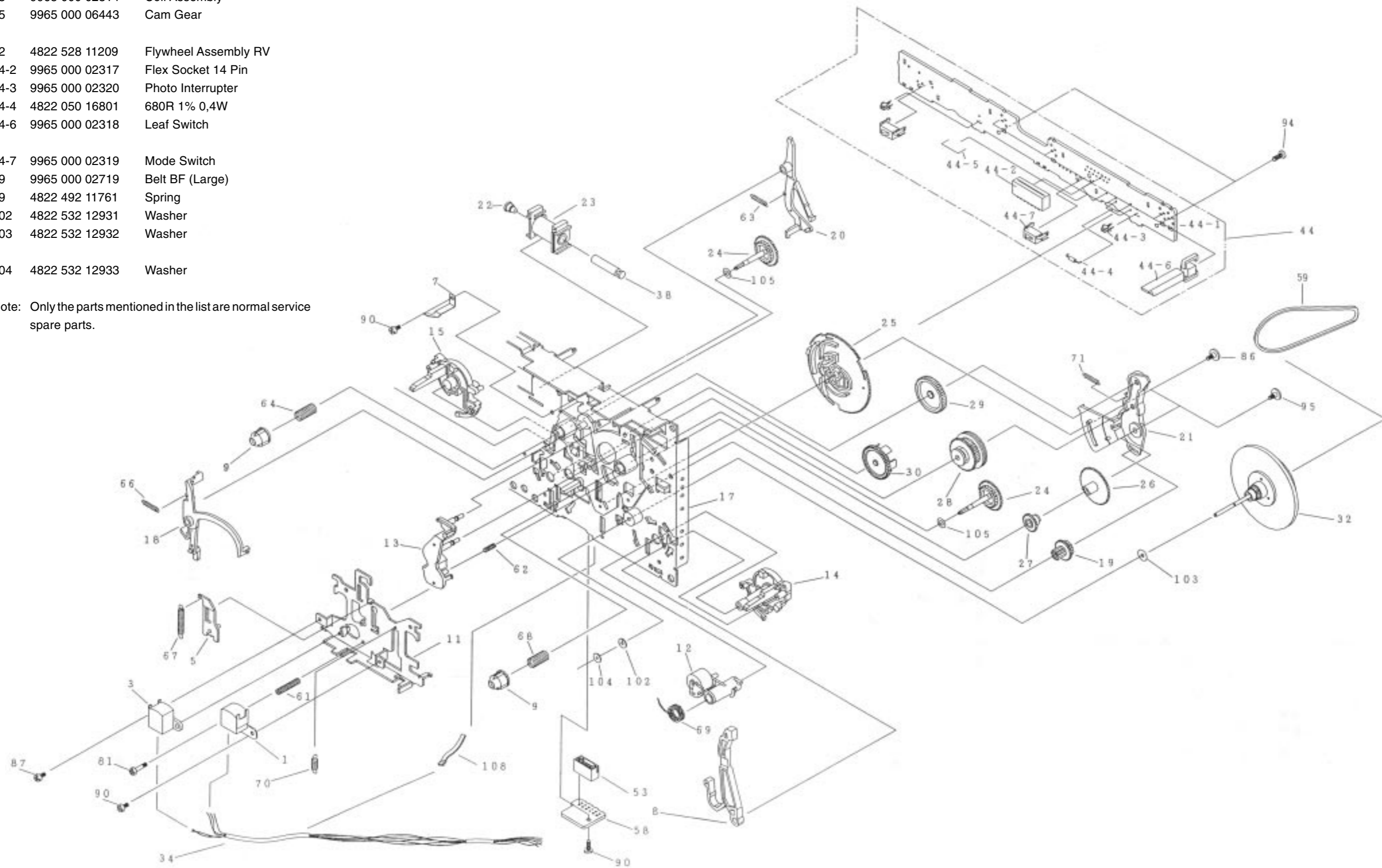


**TAPE MECHANISM B - RECORD/PLAYBACK (Non-Autoreverse version)**

**MECHANICAL PARTS - REC/PB MECHANISM**

1	9965 000 02313	Play Head
3	9965 000 02600	Head, Erase
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
59	9965 000 02719	Belt BF (Large)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.

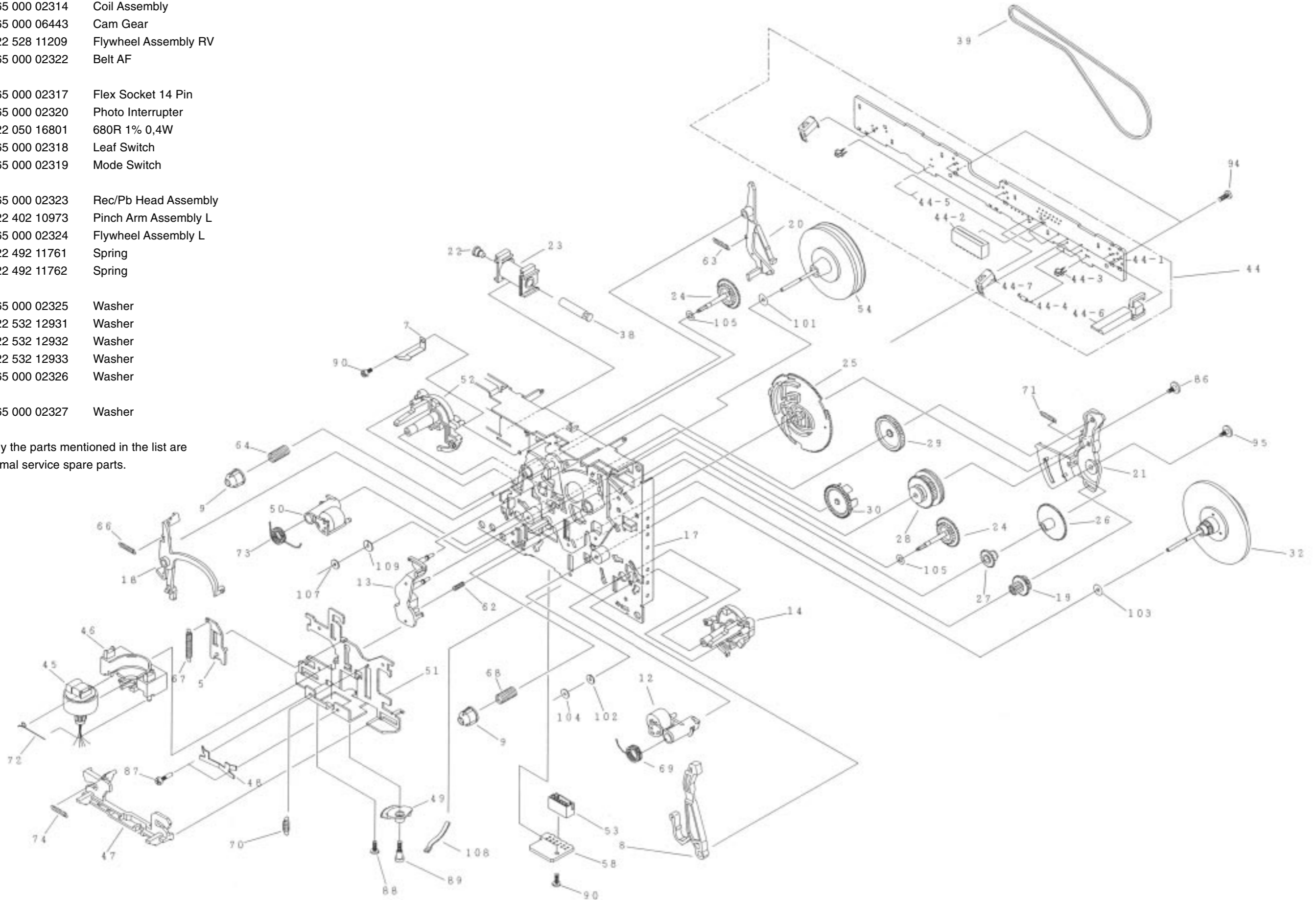


**TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse version)**

**MECHANICAL PARTS - REC/PB MECHANISM**

12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
39	9965 000 02322	Belt AF
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
45	9965 000 02323	Rec/Pb Head Assembly
50	4822 402 10973	Pinch Arm Assembly L
54	9965 000 02324	Flywheel Assembly L
69	4822 492 11761	Spring
73	4822 492 11762	Spring
101	9965 000 02325	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
107	9965 000 02326	Washer
109	9965 000 02327	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Socket 7pin Vert.
1706	482226710953	Flex Socket 7pin Vert.
1770	482226751255	Flex Socket 14pin Vert.

CAPACITORS

2621	532212231647	1nF 10% 63V
2622	532212234099	470pF 10% 63V
2623	532212234099	470pF 10% 63V
2624	482212614585	100nF 10% 50V only for Ferro
2625	482212614585	100nF 10% 50V
2701	532212233538	150pF 2% 63V Autoreverse
2701	482212233216	270pF 5% 63V Non-autoreverse
2702	532212233538	150pF 2% 63V Autoreverse
2702	482212233216	270pF 5% 63V Non-autoreverse
2703	532212232531	100pF 5% 50V Autoreverse
2703	482212233575	220pF 5% 63V Non-autoreverse
2704	532212232531	100pF 5% 50V Autoreverse
2704	482212233575	220pF 5% 63V Non-autoreverse
2705	482212233575	220pF 5% 63V
2706	482212233575	220pF 5% 63V
2707	532212234099	470pF 10% 63V
2708	532212234099	470pF 10% 63V
2709	532212231863	330pF 5% 63V
2710	532212231863	330pF 5% 63V
2711	532212232531	100pF 5% 50V
2712	532212232531	100pF 5% 50V
2713	482212440248	10µF 20% 63V
2714	482212440248	10µF 20% 63V
2715	482212480195	470µF 20% 10V
2716	482212480195	470µF 20% 10V
2717	482212233177	10nF 20% 50V Autoreverse
2717	482212613188	15nF 5% 63V Non-autoreverse
2718	482212233177	10nF 20% 50V Autoreverse
2718	482212613188	15nF 5% 63V Non-autoreverse
2719	482212612105	33nF 5% 50V
2720	482212612105	33nF 5% 50V
2721	532212231866	6,8nF 10% 63V not for Ferro
2722	532212231866	6,8nF 10% 63V not for Ferro
2723	482212613188	15nF 5% 63V
2724	482212613188	15nF 5% 63V
2725	532212610223	4,7nF 10% 63V
2726	532212610223	4,7nF 10% 63V
2727	532212234099	470pF 10% 63V Autoreverse
2727	532212231647	1nF 10% 63V Non-autoreverse
2728	532212234099	470pF 10% 63V Autoreverse
2728	532212231647	1nF 10% 63V Non-autoreverse
2729	532212232654	22nF 10% 63V
2730	532212232654	22nF 10% 63V
2733	532212234099	470pF 10% 63V
2734	532212234099	470pF 10% 63V
2735	482212614585	100nF 10% 50V
2737	482212614585	100nF 10% 50V

2738	482212614585	100nF 10% 50V
2741	482212611585	22nF +80/-20% 25V
2742	532212232654	22nF 10% 63V
2743	532212232654	22nF 10% 63V
2744	482212614585	100nF 10% 50V
2760	482212614585	100nF 10% 50V
2761	482212480144	220µF 20% 25V
2762	482212440769	4,7µF 20% 100V
2763	482212440433	47µF 20% 25V
2765	482212440433	47µF 20% 25V
2769	532212234099	470pF 10% 63V
2770	532212234099	470pF 10% 63V
2780	482212481151	22µF 20% 50V
2781	482212233177	10nF 20% 50V
2782	532212610223	4,7nF 10% 63V
2784	482212151305	15nF 10% 50V
2785	482212421913	1µF 20% 63V
2786	532212232531	100pF 5% 50V
2787	482212612105	33nF 5% 50V

RESISTORS

3601	482211711449	2k2 1% 0,1W
3602	482205120273	27k 5% 0,1W
3603	482211711449	2k2 1% 0,1W
3604	482211711148	56k 1% 0,1W
3605	482211711449	2k2 1% 0,1W
3606	482205120124	120k 5% 0,1W
3607	482211652256	2k2 5% 0,5W
3608	482205120273	27k 5% 0,1W
3609	482211652256	2k2 5% 0,5W
3610	482205120124	120k 5% 0,1W
3611	482211652256	2k2 5% 0,5W
3612	482211711148	56k 1% 0,1W
3613	482205120273	27k 5% 0,1W
3614	482205120273	27k 5% 0,1W
3616	482211710833	10k 1% 0,1W Autoreverse
3616	482205110102	1k 2% 0,25W Non-autoreverse
3618	482211711507	6k8 1% 0,1W Autoreverse
3620	482210011141	Trim. 10k 30% Autoreverse
3622	482210011141	Trim. 10k 30% Non-autoreverse
3623	482211710837	100k 1% 0,1W
3624	482211710837	100k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3628	482211710837	100k 1% 0,1W
3630	482205120471	470R 5% 0,1W
3672	482205120472	4k7 5% 0,1W Autoreverse
3674	482211652283	4k7 5% 0,5W
3676	482211710834	47k 1% 0,1W Autoreverse
3678	482211710834	47k 1% 0,1W
3679	482211710834	47k 1% 0,1W
3680	482211710834	47k 1% 0,1W

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

3685	482211652234	100k 5% 0,5W
3686	482211710837	100k 1% 0,1W
3687	482211711503	220R 1% 0,1W not for Ferro
3688	482211710361	680R 1% 0,1W Autoreverse
3701	482211711503	220R 1% 0,1W
3702	482211711503	220R 1% 0,1W
3703	482211711503	220R 1% 0,1W
3704	482211711503	220R 1% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482211711503	220R 1% 0,1W
3707	482205120101	100R 5% 0,1W
3708	482205120101	100R 5% 0,1W
3709	482205120109	10R 5% 0,1W
3710	482205120109	10R 5% 0,1W
3711	482205120154	150k 5% 0,1W
3712	482205120154	150k 5% 0,1W
3713	482205120109	10R 5% 0,1W
3714	482205120109	10R 5% 0,1W
3715	482205120182	1k8 5% 0,1W
3716	482205120182	1k8 5% 0,1W
3717	482211711449	2k2 1% 0,1W
3718	482211711449	2k2 1% 0,1W
3719	482211711383	12k 1% 0,1W
3720	482211711383	12k 1% 0,1W
3721	482205120392	3k9 5% 0,1W
3722	482205120392	3k9 5% 0,1W
3723	482211683933	15k 1% 0,1W Autoreverse
3723	482211710965	18k 1% 0,1W Non-autoreverse
3724	482211683933	15k 1% 0,1W Autoreverse
3724	482211710965	18k 1% 0,1W Non-autoreverse
3725	482205120109	10R 5% 0,1W not for Ferro
3726	482205120109	10R 5% 0,1W not for Ferro
3727	482205120562	5k6 5% 0,1W Autoreverse
3727	482211711507	6k8 1% 0,1W Non-autoreverse
3728	482205120562	5k6 5% 0,1W Autoreverse
3728	482211711507	6k8 1% 0,1W Non-autoreverse
3729	482205120332	3k3 5% 0,1W Autoreverse
3729	482205120472	4k7 5% 0,1W Non-autoreverse
3730	482205120332	3k3 5% 0,1W Autoreverse
3730	482205120472	4k7 5% 0,1W Non-autoreverse
3731	482205120822	8k2 5% 0,1W
3732	482205120822	8k2 5% 0,1W
3733	482205120122	1k2 5% 0,1W
3734	482205120122	1k2 5% 0,1W
3735	482205120223	22k 5% 0,1W
3736	482205120223	22k 5% 0,1W
3741	482211711449	2k2 1% 0,1W
3742	482211711449	2k2 1% 0,1W
3743	482211711139	1k5 1% 0,1W Autoreverse
3743	482211711449	2k2 1% 0,1W Non-autoreverse
3744	482211711139	1k5 1% 0,1W Autoreverse
3744	482211711449	2k2 1% 0,1W Non-autoreverse

3745	482205120332	3k3 5% 0,1W Autoreverse
3745	482205120562	5k6 5% 0,1W Non-autoreverse
3746	482205120332	3k3 5% 0,1W Autoreverse
3746	482205120562	5k6 5% 0,1W Non-autoreverse
3748	482211711449	2k2 1% 0,1W
3749	482211710834	47k 1% 0,1W
3751	482211710833	10k 1% 0,1W
3752	482211710837	100k 1% 0,1W
3753	482211710837	100k 1% 0,1W
3754	482205120105	1M 5% 0,1W Autoreverse
3754	482205120479	47R 5% 0,1W Non-autoreverse
3755	482205120105	1M 5% 0,1W Autoreverse
3755	482205120479	47R 5% 0,1W Non-autoreverse
3756	482211713579	220k 1% 0,1W
3757	482211713579	220k 1% 0,1W
3758	482211710833	10k 1% 0,1W
3759	482211710833	10k 1% 0,1W
3760	482205120121	120R 5% 0,1W
3761	482205021003	10k 1% 0,6W
3762	482211711454	820R 1% 0,1W
3763	482205120154	150k 5% 0,1W
3764	482211683872	220R 5% 0,5W
3765	482205120393	39k 5% 0,1W
3766	482205120475	4M7 5% 0,1W
3767	482205120475	4M7 5% 0,1W
3768	482211710833	10k 1% 0,1W
3769	482211711383	12k 1% 0,1W Autoreverse
3769	482205120822	8k2 5% 0,1W Non-autoreverse
3770	482211711139	1k5 1% 0,1W
3771	482205120122	1k2 5% 0,1W
3772	482211711507	6k8 1% 0,1W Autoreverse
3772	482205120562	5k6 5% 0,1W Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W
3774	482211683933	15k 1% 0,1W Autoreverse
3774	482205120822	8k2 5% 0,1W Non-autoreverse
3775	482205120478	4R7 5% 0,1W
3776	482211711507	6k8 1% 0,1W
3777	482211710353	150R 1% 0,1W
3778	482205210688	△ 6R8 5% 0,33W
3779	482205120334	330k 5% 0,1W
3780	482205120105	1M 5% 0,1W
3781	482205120475	4M7 5% 0,1W
3784	482205110102	1k 2% 0,25W
3786	482205120223	22k 5% 0,1W
3787	482205120105	1M 5% 0,1W
3788	482205120105	1M 5% 0,1W
3789	482211710834	47k 1% 0,1W
4701	482205120008	0R Jumper 0805
4702	482205120008	0R Jumper 0805
4703	482205120008	0R Jumper 0805
4704	482205120008	0R Jumper 0805
4705	482205120008	0R Jumper 0805

**ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD****RESISTORS**

4706	482205120008	OR Jumper 0805	6612	482213031878	1N4003G	
4707	482205120008	OR Jumper 0805	6614	482213030621	1N4148	Autoreverse
4708	482205120008	OR Jumper 0805	6770	482213030621	1N4148	
4709	482205120008	OR Jumper 0805	6771	482213030621	1N4148	
4710	482205120008	OR Jumper 0805	6772	482213030621	1N4148	
4711	482205120008	OR Jumper 0805	6773	482213030621	1N4148	
4712	482205120008	OR Jumper 0805	6774	482213030621	1N4148	
4713	482205120008	OR Jumper 0805	6775	482213030621	1N4148	
4714	482205120008	OR Jumper 0805	6776	482213030621	1N4148	
4715	482205120008	OR Jumper 0805	6777	482213034382	BZX79-F8V2	
4716	482205120008	OR Jumper 0805	6778	482213030621	1N4148	
4717	482205120008	OR Jumper 0805	6782	482213030621	1N4148	
4718	482205120008	OR Jumper 0805	6785	482213030621	1N4148	
4719	482205120008	OR Jumper 0805	6786	482213030621	1N4148	
4720	482205120008	OR Jumper 0805				
4721	482205120008	OR Jumper 0805				
4722	482205120008	OR Jumper 0805				
4723	482205120008	OR Jumper 0805				
4724	482205120008	OR Jumper 0805				
4725	482205120008	OR Jumper 0805				
4726	482205120008	OR Jumper 0805				
4727	482205120008	OR Jumper 0805				
4728	482205120008	OR Jumper 0805				
4729	482205120008	OR Jumper 0805				
4730	482205120008	OR Jumper 0805				
4731	482205120008	OR Jumper 0805				
4732	482205120008	OR Jumper 0805				
4733	482205120008	OR Jumper 0805				
4734	482205120008	OR Jumper 0805				
4735	482205120008	OR Jumper 0805				
4736	482205120008	OR Jumper 0805				
4737	482205120008	OR Jumper 0805				
4738	482205120008	OR Jumper 0805				
4739	482205120008	OR Jumper 0805				
4740	482205120008	OR Jumper 0805				
4741	482205120008	OR Jumper 0805				
4742	482205120008	OR Jumper 0805				
4744	482205120008	OR Jumper 0805				
4745	482205120008	OR Jumper 0805				
4746	482205120008	OR Jumper 0805				
4748	482205120008	OR Jumper 0805				
4785	482205120008	OR Jumper 0805 only for Ferro				
4790	482205120008	OR Jumper 0805				
4794	482205120008	OR Jumper 0805				
4795	482205120008	OR Jumper 0805				

**TRANSISTORS & INTEGRATED CIRCUITS**

7610	532220911306	HEF4094BT			
7612	482213011201	PMBT2907			
7613	482213011201	PMBT2907			
7614	482213011201	PMBT2907			
7616	482213060373	BC857B			Autoreverse
7618	482213060511	BC847B			
7619	482213060511	BC847B			
7620	482213060511	BC847B			
7622	482213060511	BC847B			Autoreverse
7623	482213060511	BC847B			
7624	482213060511	BC847B			
7710	482220932919	HEF4952BT			
7720	932214000668	AN7323S			
7730	482220932919	HEF4952BT			
7740	482220932919	HEF4952BT			
7780	482213060511	BC847B			
7781	482213042804	BC817-25			
7782	482213044568	BC557B			
7783	482213060511	BC847B			
7784	482213060373	BC857B			
7786	482213063494	J111			
7787	482213060511	BC847B			
7791	482213060511	BC847B			
7792	482213060511	BC847B			

Note: Only the parts mentioned in this list are normal service spare parts.

**COILS & FILTERS**

5701	482215711477	Coil 2,2μH 5%
5703	482215620946	Osc Coil 100kHz

**DIODES**

6611	482213031878	1N4003G
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# **3CDC-LLC-MCD1**

## **(3 Disc Carousel Changer)**

Layout stage .3

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## Service hints

### CAUTION

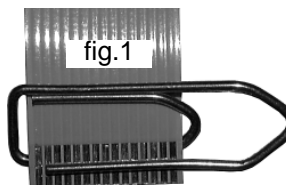
**CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE**

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

**ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.**

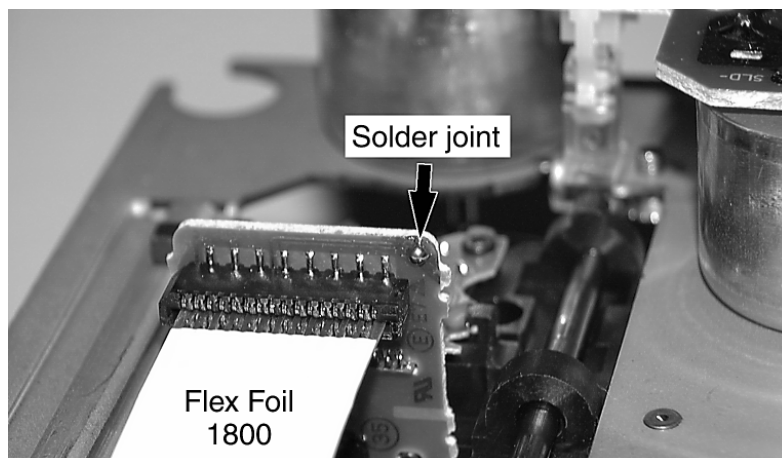
The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip on the flexfoil to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil and connect it to the new drive
5. Position the new CD drive in its studs
6. Remove solder joint from the Laserunit



**Attention:** The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.

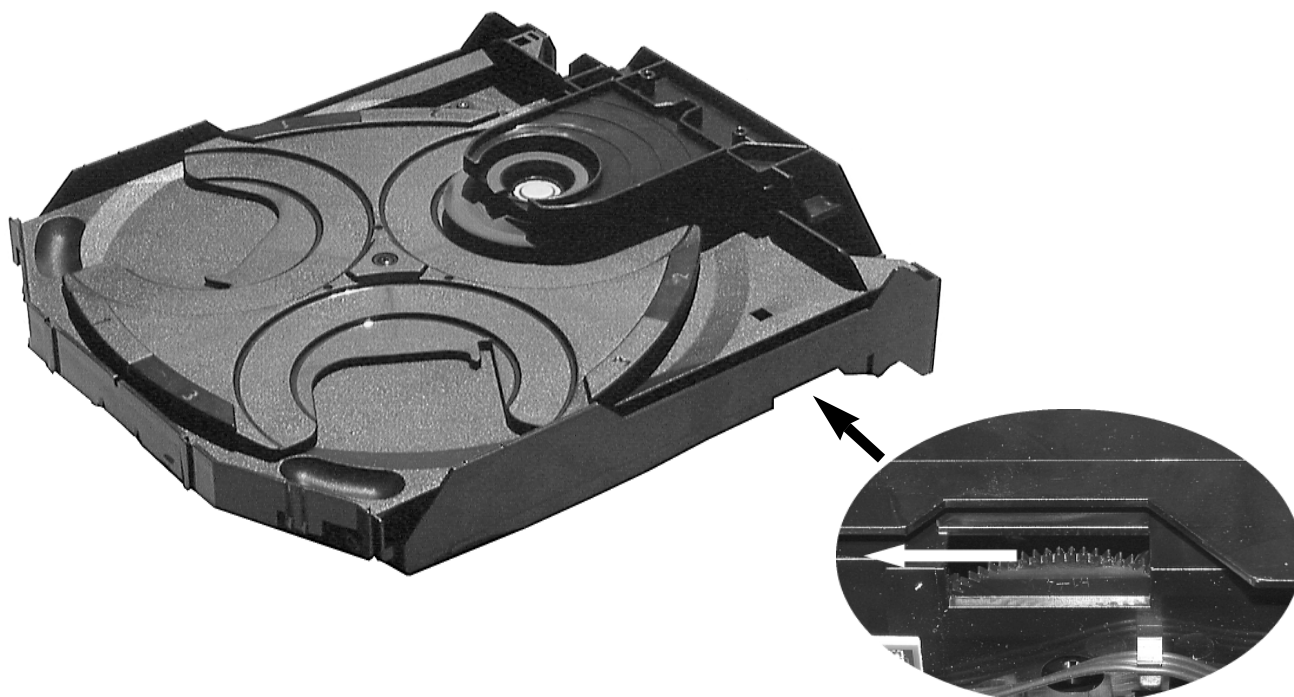
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



### Emergency open

In case of a Supply fault, the tray can be opened manually.

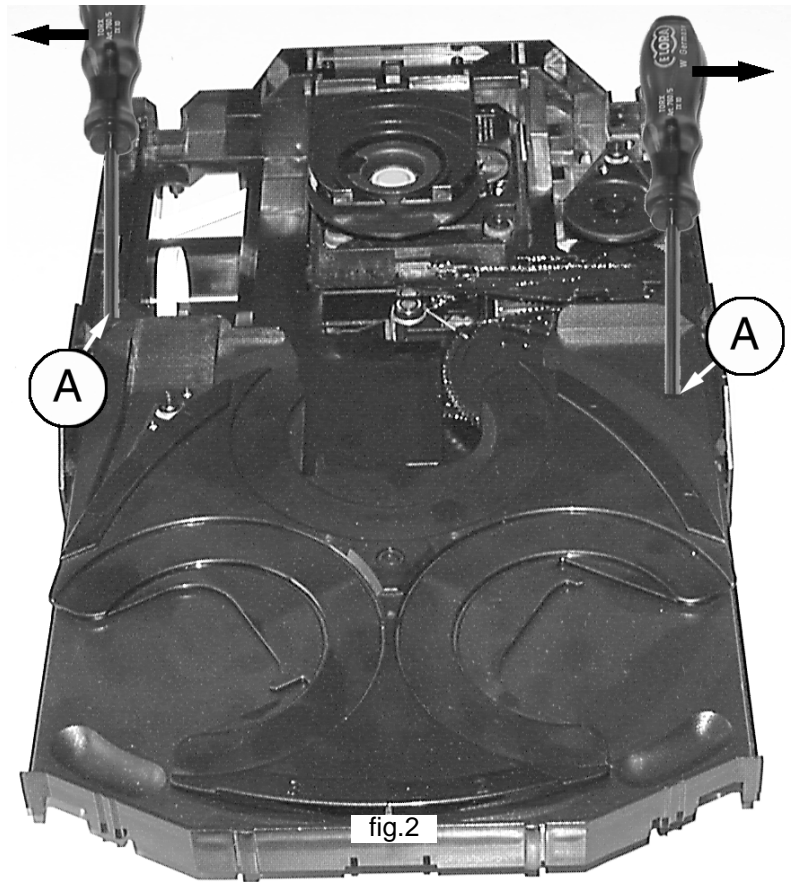
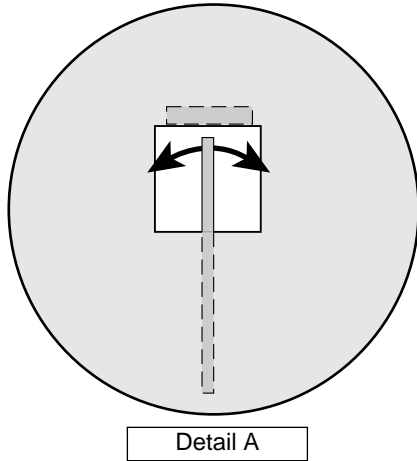
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



## Service hints

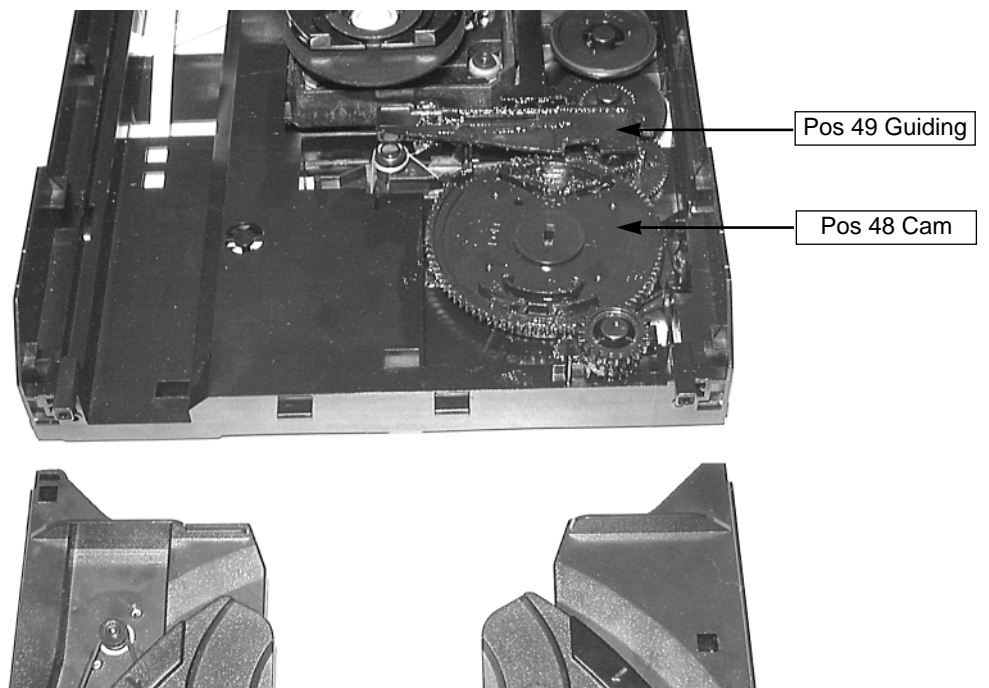
### Dismantling of Tray

1. Open the tray.
2. Release 2x catch as shown in fig. 2 and Detail A
3. Pull tray out.

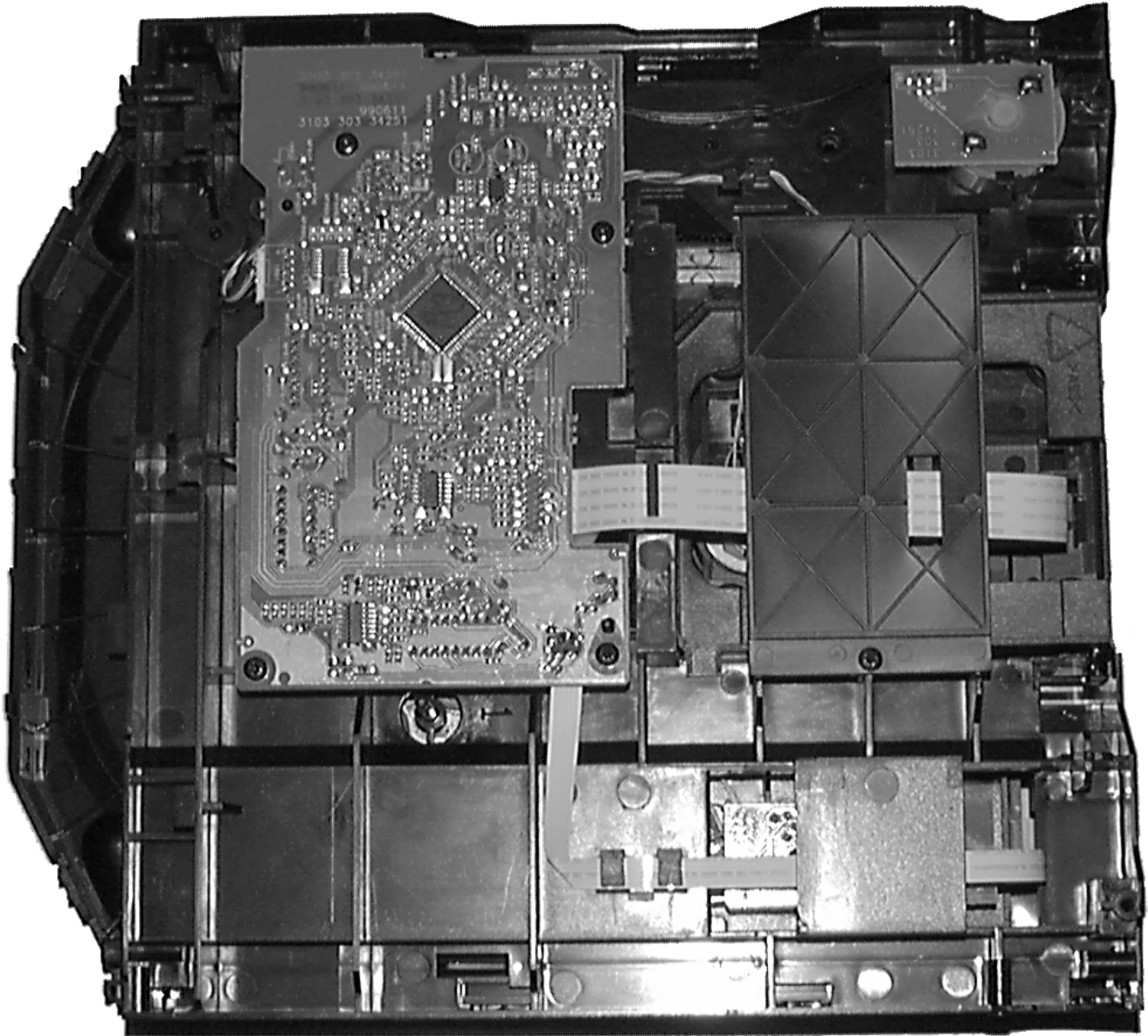


### Assembling of Tray

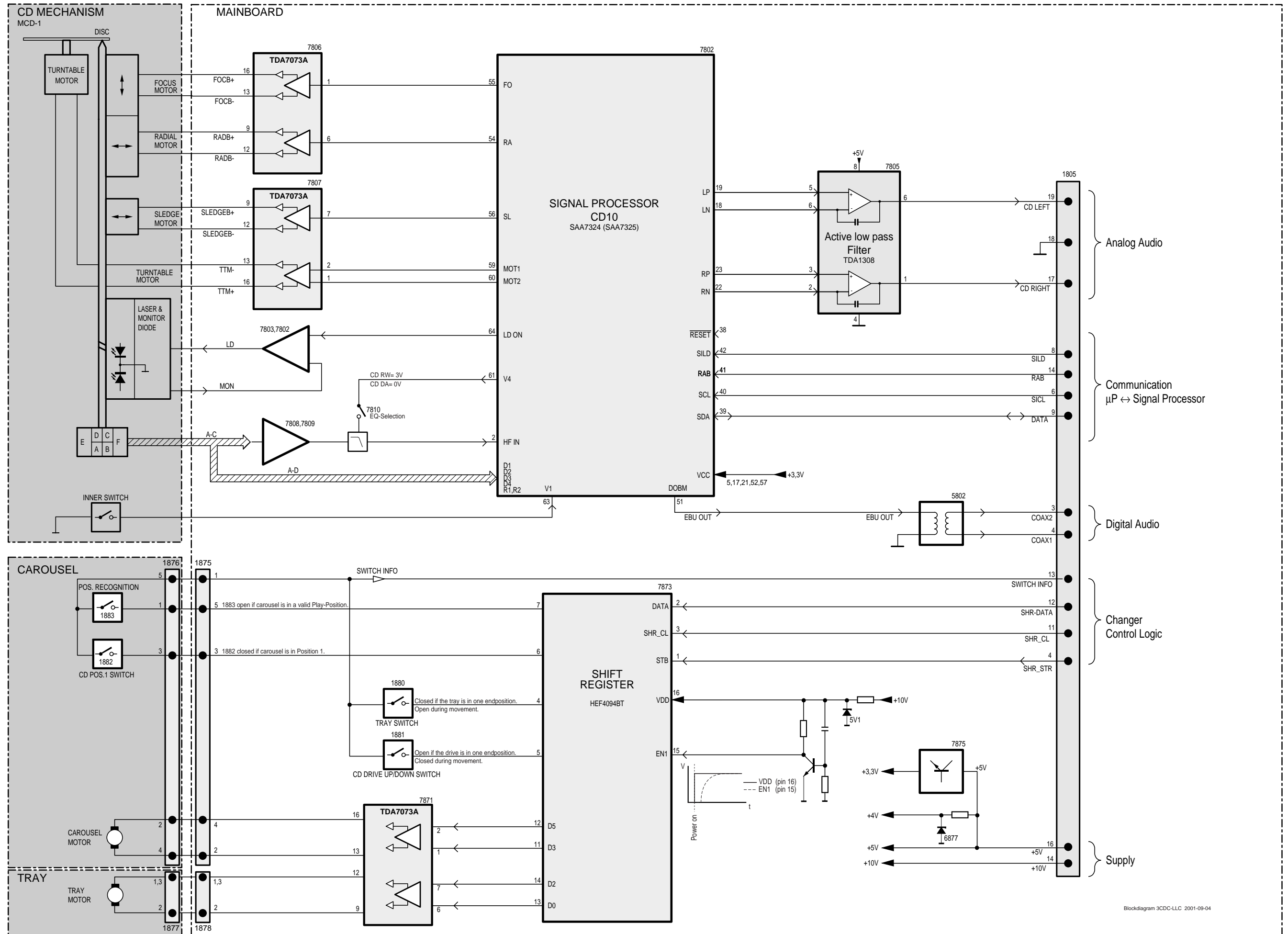
1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.



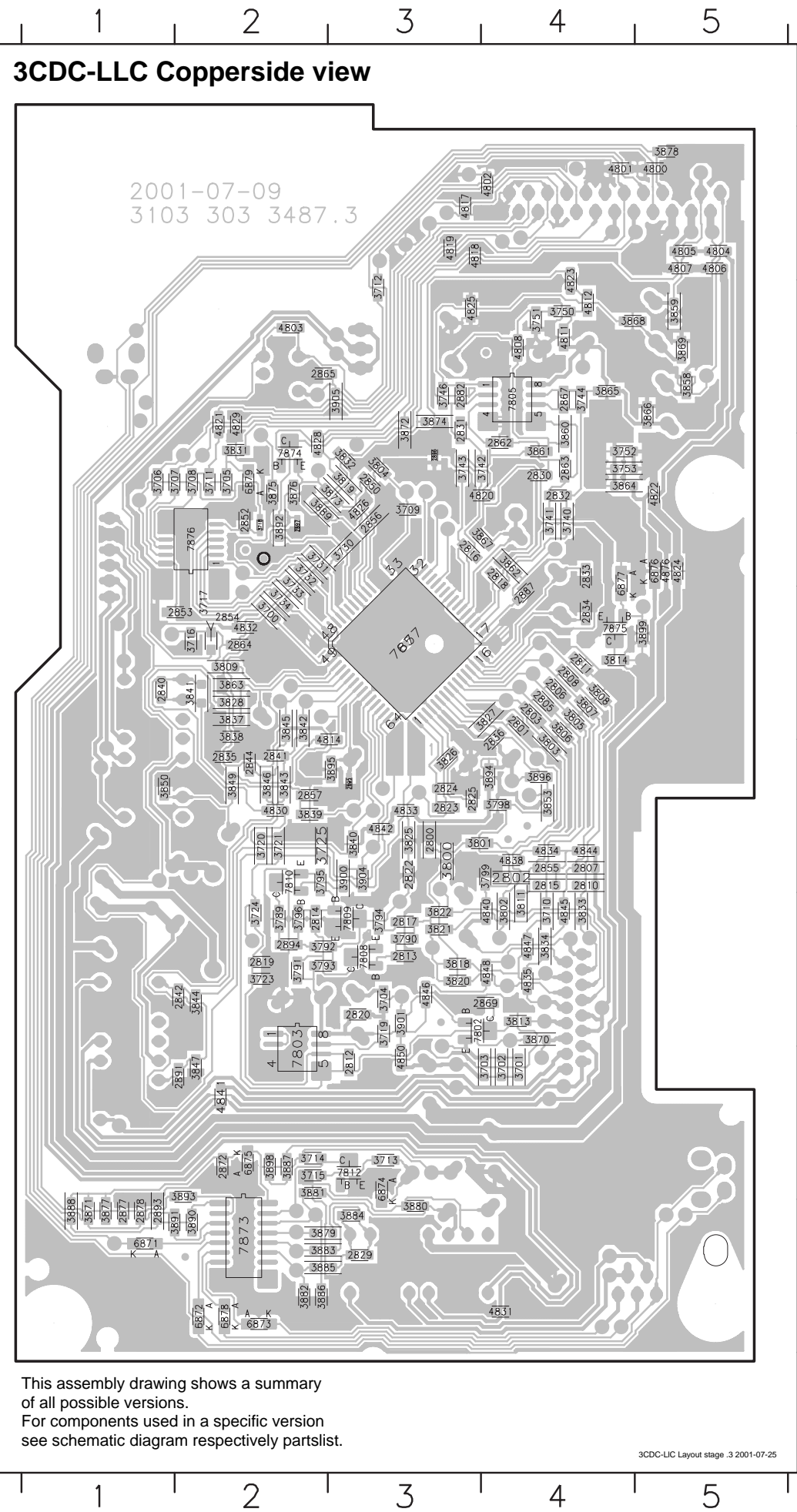
**Service Position**



# BLOCK DIAGRAM 3CDC-LLC-MCD1



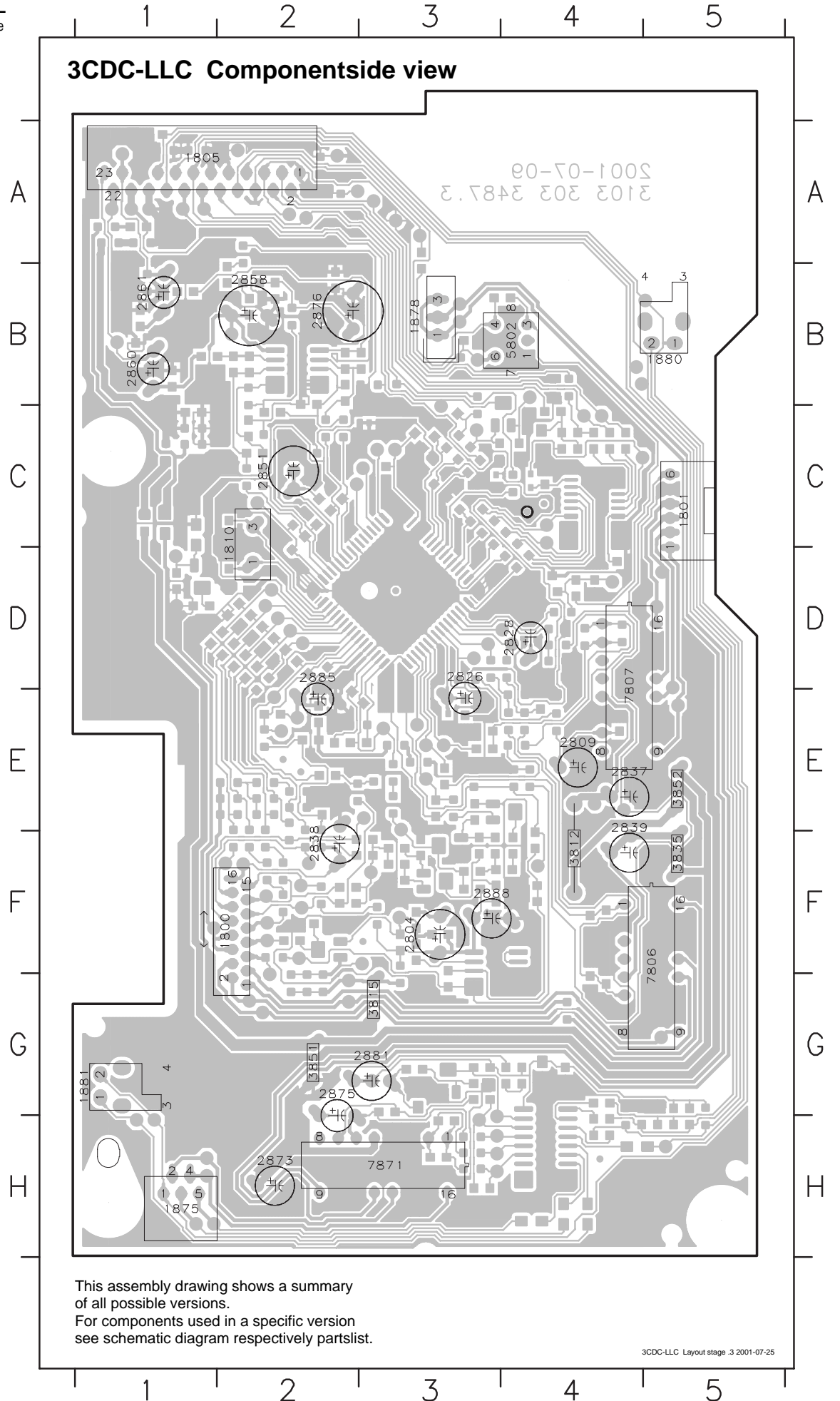




This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partlist.

### Mapping

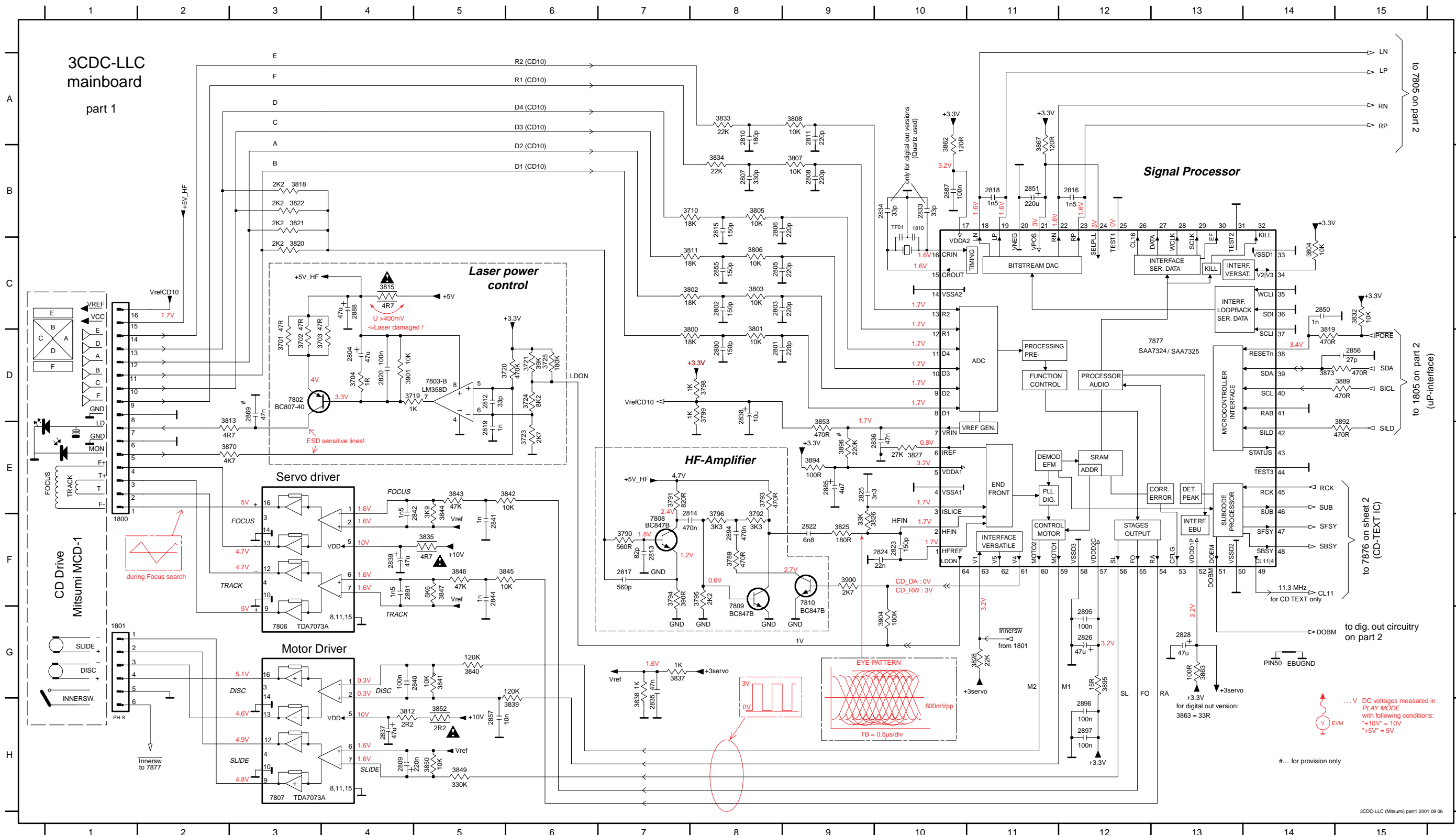
Copperside		Componentside	
2800 E3	3741 C4	3889 C2	1800 F2
2801 D4	3742 C4	3890 H2	1801 C5
2802 E4	3743 C3	3891 H2	1805 A2
2803 D4	3744 B4	3892 C2	1810 C2
2805 D4	3746 B3	3893 G2	1875 H1
2806 D4	3750 B4	3894 E4	1878 B3
2807 E4	3751 B4	3895 E3	1880 B5
2808 D4	3752 C4	3896 E4	1881 G1
2810 E4	3753 C4	3898 G2	2804 F3
2811 D4	3789 F2	3899 D5	2809 E4
2812 G3	3790 F3	3900 E3	2826 D3
2813 F3	3791 F2	3901 F3	2828 D4
2814 F2	3792 F3	3904 E3	2837 E5
2815 E4	3793 F3	3905 B3	2838 F2
2816 C3	3794 F3	4800 A5	2839 E5
2817 F3	3795 E2	4801 A4	2851 C2
2818 C4	3796 F2	4802 A4	2858 B2
2819 F2	3798 E4	4803 B2	2860 B1
2820 F3	3799 E4	4804 A5	2861 B1
2822 E3	3800 E3	4805 A5	2873 H2
2823 E3	3801 E4	4806 A5	2875 G3
2824 E3	3802 F4	4807 A5	2876 B2
2825 E3	3803 D4	4808 B4	2881 G3
2829 H3	3804 C3	4811 B4	2885 D2
2830 C4	3805 D4	4812 B4	2888 F4
2831 B3	3806 D4	4814 D3	3812 F4
2832 C4	3807 D4	4817 A3	3815 G3
2833 C4	3808 D4	4818 A3	3835 F5
2834 D4	3809 D2	4819 A3	3851 G2
2835 E2	3811 F4	4820 C4	3852 E5
2836 D4	3813 F4	4821 B2	5802 B4
2840 D1	3814 D4	4822 C5	7806 F5
2841 E2	3818 F3	4823 A4	7807 D5
2842 F2	3819 C3	4824 C5	7871 H3
2844 E2	3820 F3	4825 B3	
2850 C3	3821 F3	4826 C3	
2852 C2	3822 F3	4828 C2	
2853 D2	3825 E3	4829 B2	
2854 D2	3826 E3	4830 E2	
2855 E4	3827 D4	4831 H4	
2856 C3	3828 D2	4832 D2	
2857 E2	3831 C2	4833 E3	
2862 C4	3832 C3	4834 E4	
2863 C4	3833 F4	4835 F4	
2864 D2	3834 F4	4838 E4	
2865 B3	3837 D2	4840 F4	
2867 B4	3838 D2	4841 G2	
2869 F4	3839 E2	4842 E3	
2872 G2	3840 E3	4844 E4	
2877 H1	3841 D2	4845 F4	
2878 H1	3842 D2	4846 F3	
2882 B3	3843 E2	4847 F4	
2887 C4	3844 F2	4848 F4	
2891 G2	3845 D2	4850 G3	
2893 H1	3846 E2	4876 C5	
2894 F2	3847 G2	6871 H1	
2895 E3	3849 E2	6872 H2	
2896 C3	3850 E1	6873 H2	
2897 C2	3853 E4	6874 G3	
3700 D2	3858 B5	6875 G2	
3701 G4	3859 B5	6876 C5	
3702 G4	3860 B4	6877 C4	
3703 G4	3861 C4	6878 H2	
3704 F3	3862 C4	6879 C2	
3705 C2	3863 D2	7802 F4	
3706 C1	3864 C4	7803 F2	
3707 C2	3865 B4	7805 B4	
3708 C2	3866 B5	7808 F3	
3709 C3	3867 C4	7809 F3	
3710 F4	3868 B5	7810 E2	
3711 C2	3869 B5	7812 G3	
3712 A3	3870 F4	7873 H2	
3713 G3	3871 H1	7874 C2	
3714 G2	3872 B3	7875 D4	
3715 G2	3873 C3	7876 C2	
3716 D2	3874 B3	7877 D3	
3717 D2	3875 C2		
3718 C2	3876 C2		
3719 F3	3877 H1		
3720 E2	3878 A5		
3721 E2	3879 H3		
3723 F2	3880 G3		
3724 F2	3881 G2		
3725 E2	3882 H2		
3730 C3	3883 H3		
3731 C2	3884 H3		
3732 C2	3885 H3		
3733 C2	3886 H2		
3734 D2	3887 G2		
3740 C4	3888 H1		

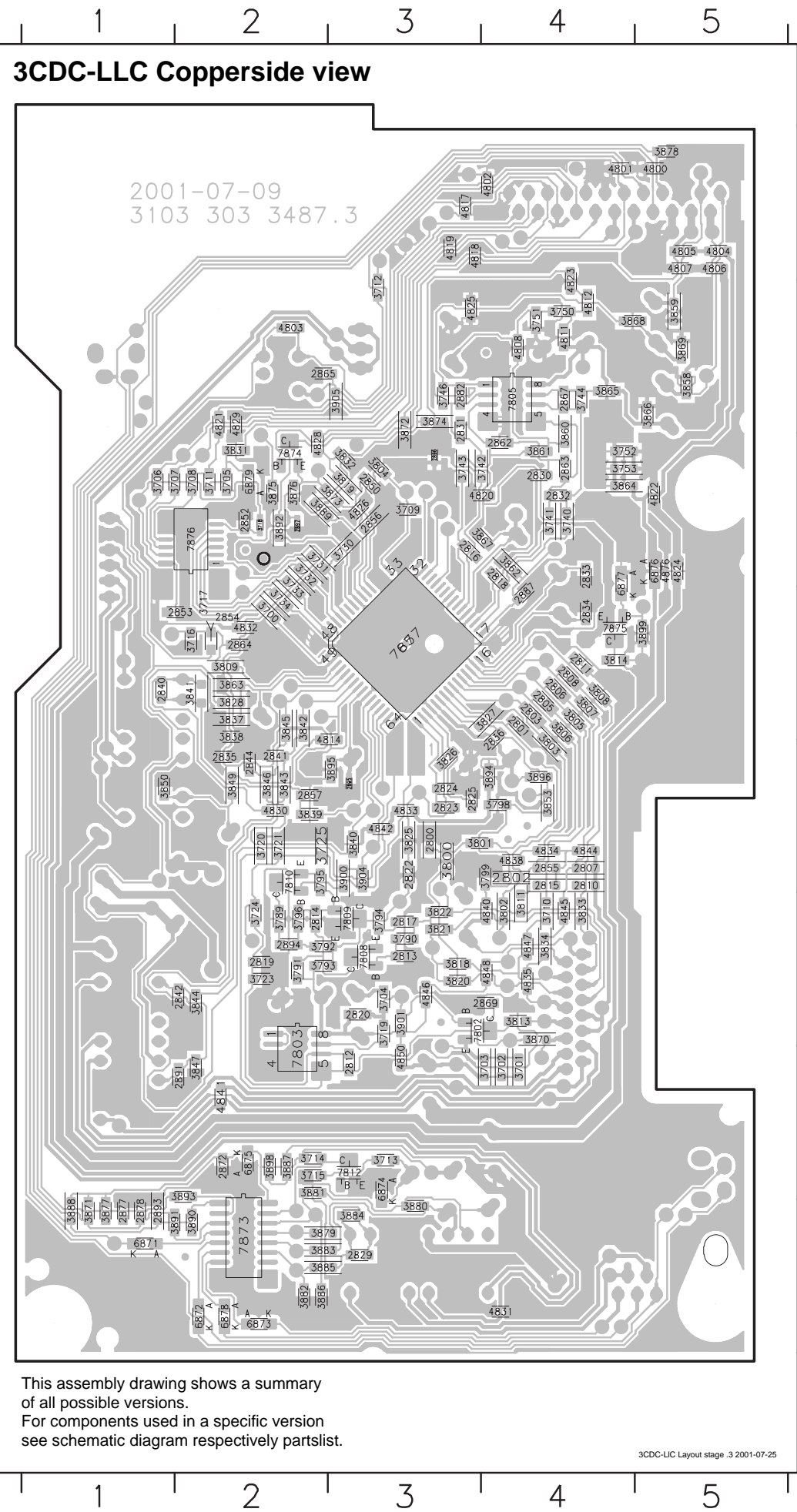


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partlist.



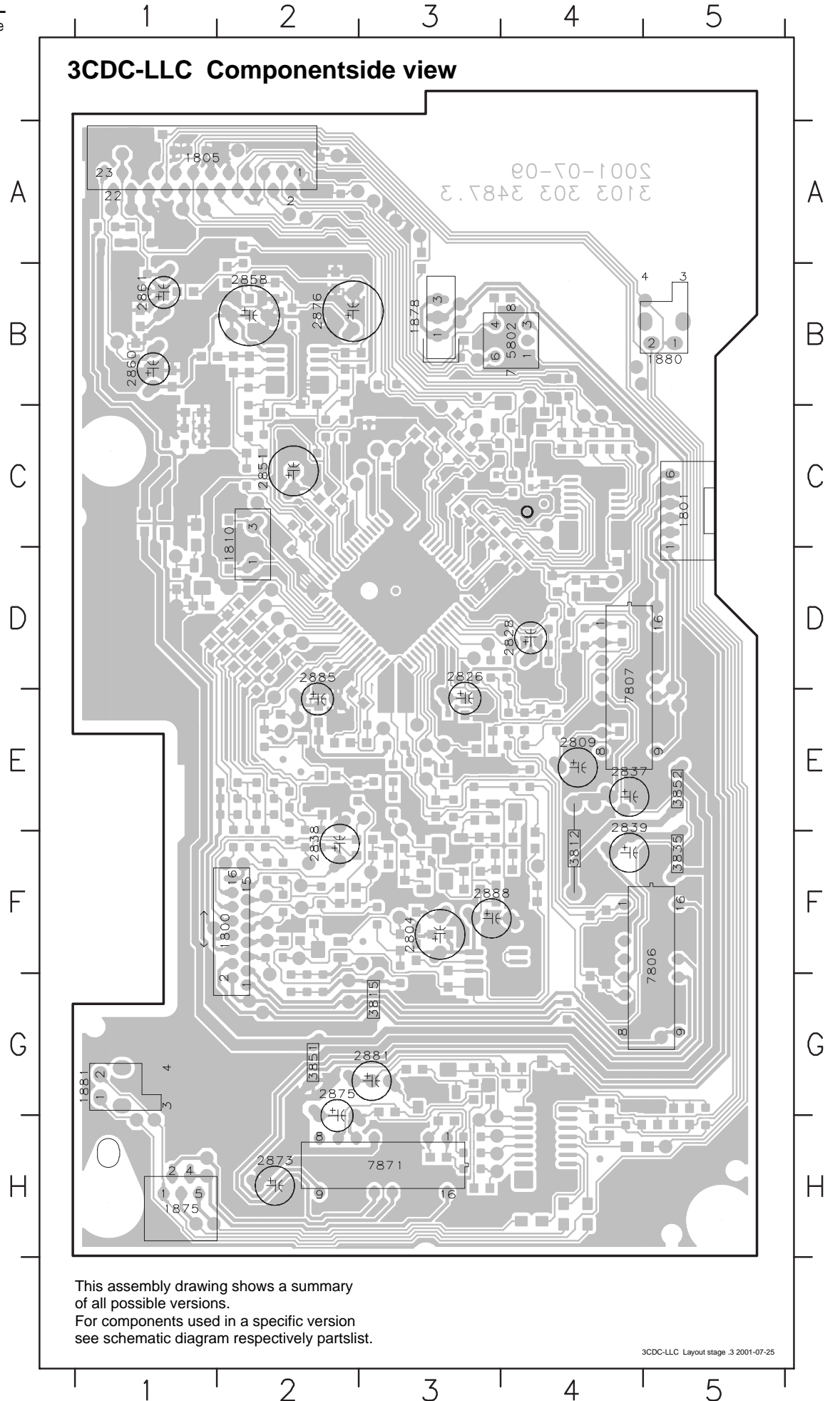
1800 F1	2804 D4	2811 A9	2818 B11	2826 G12	2838 D8	2851 B11	2888 C4	3702 D3	3721 D6	3792 F8	3800 D8	3807 B9	3819 D14	3828 G11	3839 H6	3846 F5	3863 G13	3895 G12	7803-B D5	MP713 C9	MP743 D2	MP813 B3	MP820 F8	MP837 D4	MP844 E9	MP851 E2	MP873 H4	MP884 C5
1801 G1	2805 C8	2812 D5	2819 E5	2828 G13	2839 F4	2855 C8	2891 F4	3703 D3	3723 E6	3793 E8	3801 D8	3808 A9	3820 C3	3832 C15	3840 G5	3847 F5	3867 A11	3896 E9	7806 G3	MP715 D9	MP744 C2	MP814 G2	MP821 C15	MP838 G6	MP845 F4	MP852 G2	MP875 F13	MP893 F10
1810 B10	2806 B8	2813 F7	2820 D4	2833 B10	2840 G4	2856 D15	2894 F8	3704 D4	3724 D6	3794 F7	3802 C8	3811 C8	3821 B3	3833 A8	3841 G5	3849 H5	3870 E2	3900 F9	7807 H3	MP716 B9	MP745 E2	MP815 B3	MP827 B10	MP839 G6	MP846 H2	MP853 G2	MP876 E2	
2800 D8	2807 B8	2814 F7	2822 F9	2834 B10	2841 F5	2857 H5	2895 G12	3709 C14	3725 D6	3795 F8	3803 C8	3812 H4	3822 B3	3834 B8	3842 E6	3850 H5	3873 D14	3901 D4	7808 F7	MP717 A9	MP800 E2	MP816 A3	MP828 G11	MP840 E6	MP847 H2	MP858 G8	MP877 E3	
2801 D8	2808 B9	2815 B8	2823 F10	2835 H7	2842 E5	2869 D3	2896 H12	3710 B8	3789 F8	3796 F8	3804 C14	3813 E2	3825 F9	3835 F5	3843 E5	3852 H5	3889 D15	3904 G10	7809 G8	MP729 B9	MP802 B15	MP817 A3	MP829 A3	MP841 F6	MP848 E2	MP859 E10	MP878 B13	
2802 C8	2809 H4	2816 B12	2824 F10	2836 E10	2844 F5	2885 E9	2897 H12	3719 D4	3790 F7	3798 D8	3805 B8	3815 C4	3826 F9	3837 G7	3844 E5	3853 E9	3892 E15	7802 D3	7810 F9	MP730 C9	MP809 D10	MP818 C4	MP831 A4	MP842 H6	MP849 E2	MP860 C2	MP879 B11	
2803 C8	2810 A8	2817 F7	2825 E9	2837 H4	2850 C14	2887 B10	3701 D3	3720 D5	3791 E7	3799 D8	3806 C8	3818 B3	3827 E10	3838 H7	3845 F6	3862 A10	3894 E9	7803-A B5	7877 D12	MP731 B13	MP812 G2	MP819 F10	MP836 D3	MP843 G7	MP850 E2	MP872 C15	MP883 C4	



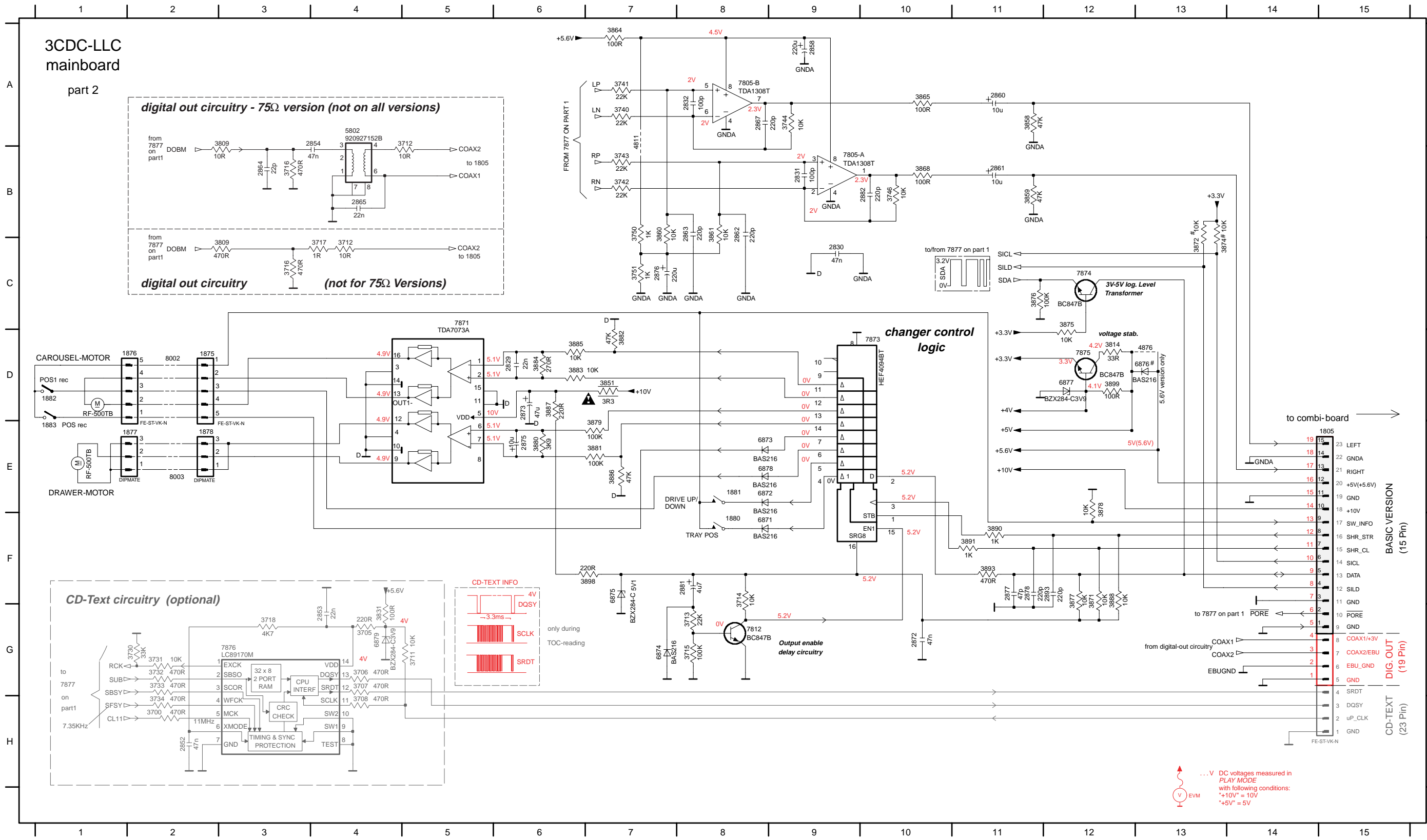


### Mapping

Copperside		Componentside	
2800 E3	3741 C4	3889 C2	1800 F2
2801 D4	3742 C4	3890 H2	1801 C5
2802 E4	3743 C3	3891 H2	1805 A2
2803 D4	3744 B4	3892 C2	1810 C2
2805 D4	3746 B3	3893 G2	1875 H1
2806 D4	3750 B4	3894 E4	1878 B3
2807 E4	3751 B4	3895 E3	1880 B5
2808 D4	3752 C4	3896 E4	1881 G1
2810 E4	3753 C4	3898 G2	2804 F3
2811 D4	3789 F2	3899 D5	2809 E4
2812 G3	3790 F3	3900 E3	2826 D3
2813 F3	3791 F2	3901 F3	2828 D4
2814 F2	3792 F3	3904 E3	2837 E5
2815 E4	3793 F3	3905 B3	2838 F2
2816 C3	3794 F3	4800 A5	2839 E5
2817 F3	3795 E2	4801 A4	2851 C2
2818 C4	3796 F2	4802 A4	2858 B2
2819 F2	3798 E4	4803 B2	2860 B1
2820 F3	3799 E4	4804 A5	2861 B1
2822 E3	3800 E3	4805 A5	2873 H2
2823 E3	3801 E4	4806 A5	2875 G3
2824 E3	3802 F4	4807 A5	2876 B2
2825 E3	3803 D4	4808 B4	2881 G3
2829 H3	3804 C3	4811 B4	2885 D2
2830 C4	3805 D4	4812 B4	2888 F4
2831 B3	3806 D4	4814 D3	3812 F4
2832 C4	3807 D4	4817 A3	3815 G3
2833 C4	3808 D4	4818 A3	3835 F5
2834 D4	3809 D2	4819 A3	3851 G2
2835 E2	3811 F4	4820 C4	3852 E5
2836 D4	3813 F4	4821 B2	5802 B4
2840 D1	3814 D4	4822 C5	7806 F5
2841 E2	3818 F3	4823 A4	7807 D5
2842 F2	3819 C3	4824 C5	7871 H3
2844 E2	3820 F3	4825 B3	
2850 C3	3821 F3	4826 C3	
2852 C2	3822 F3	4828 C2	
2853 D2	3825 E3	4829 B2	
2854 D2	3826 E3	4830 E2	
2855 E4	3827 D4	4831 H4	
2856 C3	3828 D2	4832 D2	
2857 E2	3831 C2	4833 E3	
2862 C4	3832 C3	4834 E4	
2863 C4	3833 F4	4835 F4	
2864 D2	3834 F4	4838 E4	
2865 B3	3837 D2	4840 F4	
2867 B4	3838 D2	4841 G2	
2869 F4	3839 E2	4842 E3	
2872 G2	3840 E3	4844 E4	
2877 H1	3841 D2	4845 F4	
2878 H1	3842 D2	4846 F3	
2882 B3	3843 E2	4847 F4	
2887 C4	3844 F2	4848 F4	
2891 G2	3845 D2	4850 G3	
2893 H1	3846 E2	4876 C5	
2894 F2	3847 G2	6871 H1	
2895 E3	3849 E2	6872 H2	
2896 C3	3850 E1	6873 H2	
2897 C2	3853 E4	6874 G3	
3700 D2	3858 B5	6875 G2	
3701 G4	3859 B5	6876 C5	
3702 G4	3860 B4	6877 C4	
3703 G4	3861 C4	6878 H2	
3704 F3	3862 C4	6879 C2	
3705 C2	3863 D2	7802 F4	
3706 C1	3864 C4	7803 F2	
3707 C2	3865 B4	7805 B4	
3708 C2	3866 B5	7808 F3	
3709 C3	3867 C4	7809 F3	
3710 F4	3868 B5	7810 E2	
3711 C2	3869 B5	7812 G3	
3712 A3	3870 F4	7873 H2	
3713 G3	3871 H1	7874 C2	
3714 G2	3872 B3	7875 D4	
3715 G2	3873 C3	7876 C2	
3716 D2	3874 B3	7877 D3	
3717 D2	3875 C2		
3718 C2	3876 C2		
3719 F3	3877 H1		
3720 E2	3878 A5		
3721 E2	3879 H3		
3723 F2	3880 G3		
3724 F2	3881 G2		
3725 E2	3882 H2		
3730 C3	3883 H3		
3731 C2	3884 H3		
3732 C2	3885 H3		
3733 C2	3886 H2		
3734 D2	3887 G2		
3740 C4	3888 H1		



1805 E15	2830 C9	2858 A9	2865 C4	2877 F11	3705 G4	3713 G8	3730 G2	3741 A7	3751 C7	3851 D7	3865 A10	3874 C13	3880 E6	3886 E7	3898 F7	4876 D13	6875 F7	7805-B A8	7876 G3	MP726 D8	MP804 G14	MP811 F14	MP832 G9	MP863 C11	MP871 D6	MP888 G5	MP898 E13
1875 D2	2831 B9	2860 A11	2867 A8	2878 F11	3706 G4	3714 F8	3731 G2	3742 B7	3752 A6	3858 A11	3866 A10	3875 C12	3881 E7	3887 D6	3899 D12	5802 B4	6876 D13	7812 G8	7812 G8	MP721 C8	MP740 H14	MP805 F13	MP822 E3	MP865 D11	MP874 D12	MP889 G5	MP899 E14
1878 E2	2832 A8	2861 B11	2872 G10	2881 F8	3707 G4	3715 G8	3732 G2	3743 B7	3753 A6	3859 B11	3868 B10	3876 C11	3882 D7	3888 F12	3905 C5	6871 F8	6877 D12	7871 C5	7873 D10	MP722 E8	MP742 G14	MP806 F13	MP823 E3	MP835 F14	MP866 E8	MP881 G2	MP890 B3
1880 F8	2852 H2	2862 B8	2873 D6	2882 B10	3708 H4	3716 B3	3733 G2	3744 A9	3809 B2	3860 B7	3869 B10	3877 F12	3883 D6	3890 F11	4803 B4	6872 E8	6878 E8	7873 D10	7874 C12	MP723 D8	MP742 G14	MP807 F14	MP824 D4	MP854 A13	MP867 E8	MP882 G2	MP891 B5
1881 E8	2853 G4	2863 B8	2875 E6	2883 F12	3711 G5	3717 B3	3734 H2	3746 B10	3814 D12	3861 B8	3871 F12	3878 E12	3884 D6	3891 F11	4811 A7	6873 E8	6879 G4	7874 C12	7875 D12	MP724 D8	MP801 E12	MP808 F13	MP825 D4	MP856 E14	MP868 F8	MP886 G3	MP892 B5
2829 D6	2854 B3	2864 B3	2876 C7	3700 H2	3712 B4	3718 G3	3740 A7	3750 B7	3831 G4	3864 A7	3872 C13	3879 D7	3885 D6	3893 F11	4812 B7	6874 G7	7805-A B9	7875 D12	MP725 D8	MP803 F10	MP810 F13	MP830 A7	MP857 B13	MP869 C12	MP887 H5	MP897 E13	

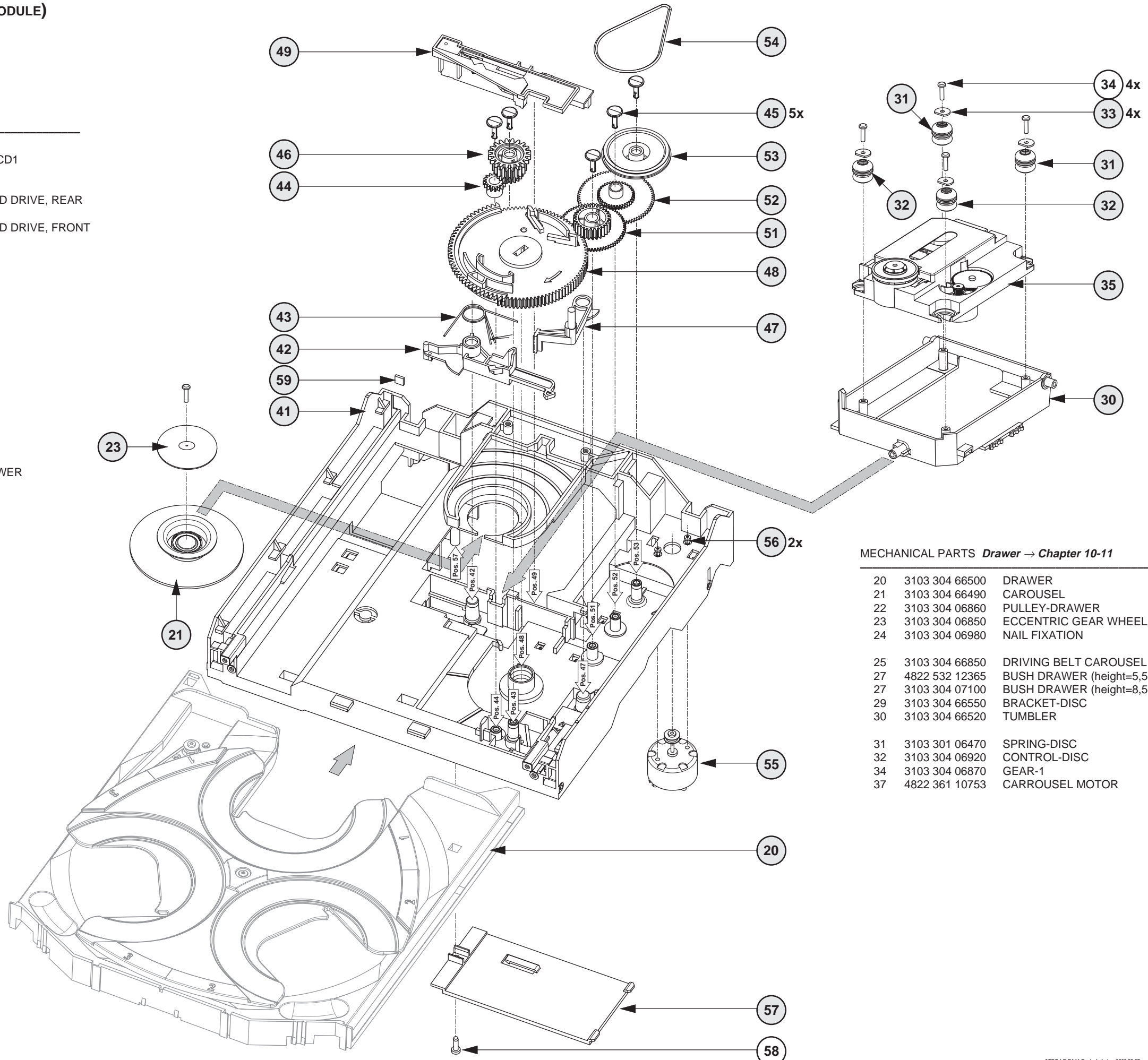




**EXPLODED VIEW (3CDC-LC MODULE)**

**MECHANICAL PARTS Loader → this page**

20	3103 304 66500	DRAWER
21	3140 114 29070	PRESSURE RING-MCD1
23	3140 111 21270	METAL RING-MCD1
30	3103 304 66560	SUPPORT
31	4822 529 10386	RUBBER DAMPER CD DRIVE, REAR
32	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
33	3103 304 06970	WASHER
35	3103 309 05350	CD DRIVE MCD1B
41	3103 304 66480	FRAME
42	3103 304 66540	BRACKET-GUIDING
43	3103 301 06460	SPRING-GUIDING
44	3103 304 06890	GEAR-3
45	3103 304 06980	NAIL FIXATION
46	3103 304 06880	GEAR-2
47	3103 304 66530	BRACKET-LOAD
48	3103 304 06910	CAM
49	3103 304 66510	GUIDING
51	3103 304 06900	GEAR-4
52	3103 304 06870	GEAR-1
53	3103 304 06960	PULLEY-FRAME
54	3103 304 66910	DRIVING-BELT-DRAWER
55	4822 361 10753	TRAY MOTOR
56	4822 502 12548	SCREW M2,6X3,5
57	3103 304 69880	COVER-MCD1
59	4822 466 12146	RUBBER

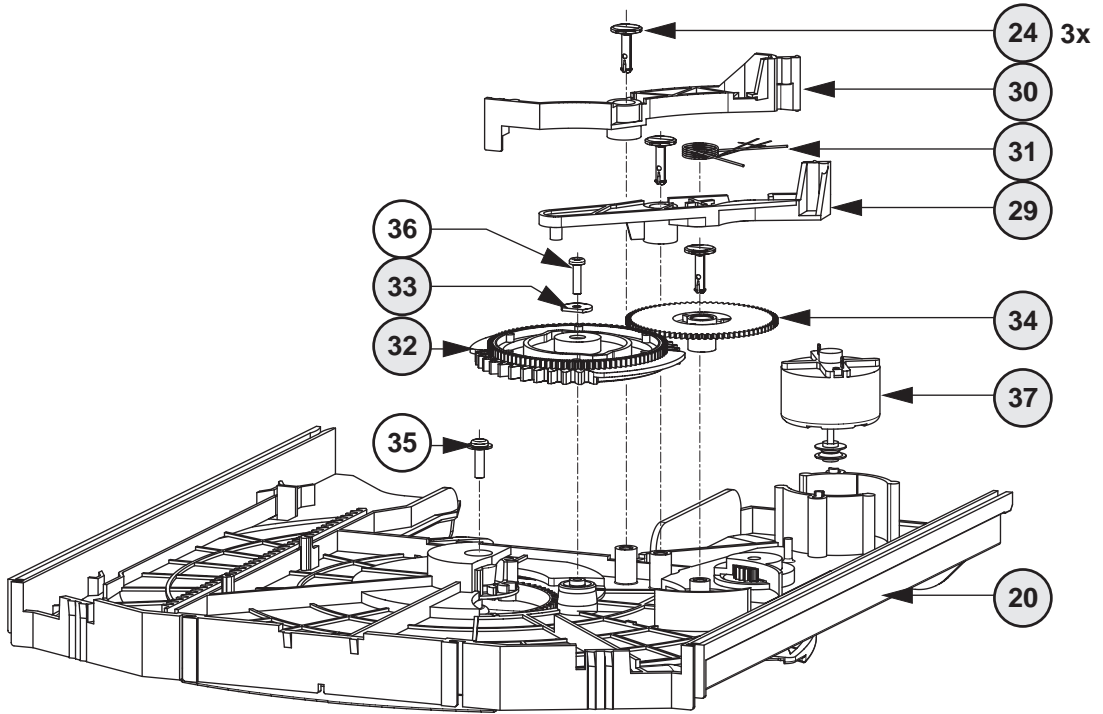


**MECHANICAL PARTS Drawer → Chapter 10-11**

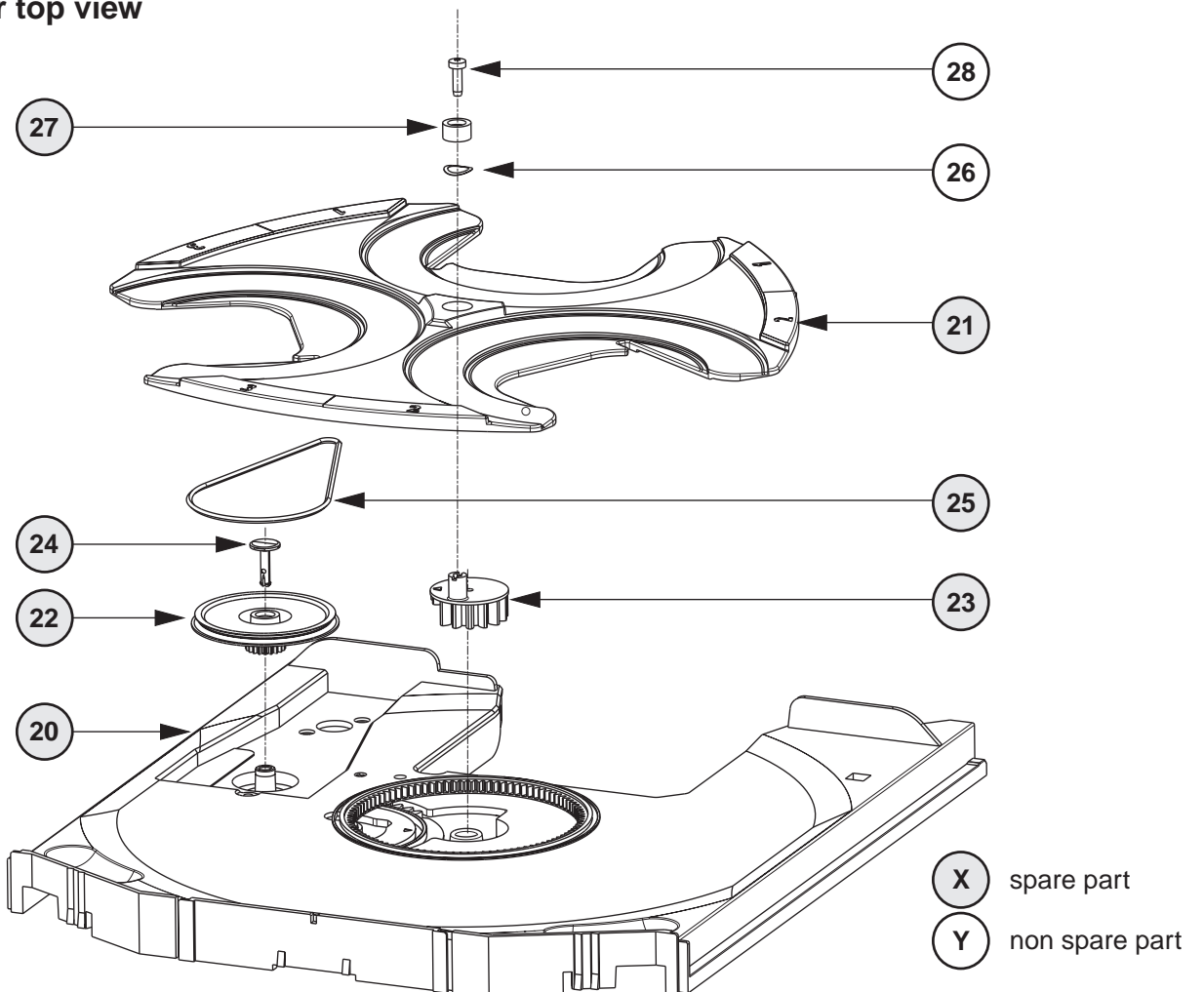
20	3103 304 66500	DRAWER
21	3103 304 66490	CAROUSEL
22	3103 304 06860	PULLEY-DRAWER
23	3103 304 06850	ECCENTRIC GEAR WHEEL
24	3103 304 06980	NAIL FIXATION
25	3103 304 66850	DRIVING BELT CAROUSEL
27	4822 532 12365	BUSH DRAWER (height=5,5mm,d=9,4mm)
27	3103 304 07100	BUSH DRAWER (height=8,5mm,d=16mm)
29	3103 304 66550	BRACKET-DISC
30	3103 304 66520	TUMBLER
31	3103 301 06470	SPRING-DISC
32	3103 304 06920	CONTROL-DISC
34	3103 304 06870	GEAR-1
37	4822 361 10753	CARROUSEL MOTOR

- X** spare part
- Y** non spare part

Drawer bottom view



Drawer top view



**ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE****MISCELLANEOUS**

35	3103 309 05350	CD DRIVE MCD1B
37	4822 361 10753	CAROUSEL MOTOR
55	4822 361 10753	TRAY MOTOR
1800	2422 025 17389	FLEX FOIL CONNECTOR 16Pin
1805	4822 265 10979	FLEX FOIL CONNECTOR 15Pin
1805	4822 265 11545	FLEX FOIL CONNECTOR 19Pin
1875	4822 267 10958	FLEX FOIL CONNECTOR 5Pin
1876	2422 025 08332	FLEX FOIL CONNECTOR 5Pin
1880	4822 276 13503	SWITCH, Tray switch
1881	4822 276 13503	SWITCH, Drive UP/DOWN
1882	4822 276 13503	SWITCH, CD Pos.1 recognized
1883	4822 276 13503	SWITCH, valid CD Play position
8002	3103 308 91990	FLEX FOIL CABLE 5P, 200mm 1:n
8005	3103 308 92930	FLEX FOIL CABLE 16P 170mm 1:n

**CAPACITORS**

2800	4822 122 33172	390pF	5%	50V
2801	4822 126 13883	220pF	5%	50V
2802	4822 122 33172	390pF	5%	50V
2803	4822 126 13883	220pF	5%	50V
2804	4822 124 41751	47μF	20%	16V
2805	4822 126 13883	220pF	5%	50V
2806	4822 126 13883	220pF	5%	50V
2807	5322 122 31863	330pF	5%	50V
2808	4822 126 13883	220pF	5%	50V
2809	4822 124 40746	0,22μF	20%	63V
2810	4822 126 10326	180pF	5%	
2811	4822 126 13883	220pF	5%	50V
2812	2222 867 15339	33pF	5%	50V
2813	4822 126 14226	82pF		50V
2814	2238 246 59858	450nF	20%	10V
2815	4822 122 33172	390pF	5%	50V
2816	4822 126 14247	1,5nF	10%	50V
2817	4822 126 14249	560pF	10%	50V
2818	4822 126 13344	1,5nF	5%	63V
2819	5322 126 11578	1nF	10%	63V
2820	4822 126 14305	100nF	10%	16V
2822	5322 122 31866	6,8nF	10%	63V
2823	3198 016 31510	150pF	10%	50V
2824	5322 122 32654	22nF	10%	63V
2825	4822 122 33891	3,3nF	10%	63V
2826	4822 124 12362	47μF	20%	4V
2828	4822 124 12362	47μF	20%	4V
2829	3198 017 42230	22nF	10%	50V
2830	4822 126 13751	47nF	10%	50V
2831	4822 122 31765	100pF	5%	50V
2832	4822 122 31765	100pF	5%	50V
2835	3198 024 44730	47nF	5%	50V
2836	3198 024 44730	47nF	5%	50V
2837	4822 124 40433	47μF	20%	25V
2838	4822 124 40248	10μF	20%	63V
2839	4822 124 40433	47μF	20%	25V
2840	4822 126 14585	100nF	10%	50V
2841	5322 126 10511	1nF	5%	50V
2842	4822 126 14247	1,5nF	10%	50V
2844	3198 016 31020	1nF	5%	25V
2850	5322 126 11578	1nF	10%	63V
2851	4822 124 42383	220μF	20%	4V
2855	4822 122 33172	390pF	5%	50V
2856	4822 126 13691	27pF	1%	63V
2857	5322 126 11583	10nF	10%	63V
2858	4822 124 12245	220μF	20%	16V

**CAPACITORS**

2860	4822 124 11947	10μF	20%	16V
2861	4822 124 11947	10μF	20%	16V
2862	4822 126 13883	220pF	5%	50V
2863	4822 126 13883	220pF	5%	50V
2865	4822 126 14494	22nF	10%	25V
2867	4822 126 13883	220pF	5%	50V
2872	3198 024 44730	47nF	5%	50V
2873	4822 124 80231	47μF	20%	16V
2875	4822 124 11947	10μF	20%	16V
2876	4822 124 12245	220μF	20%	16V
2877	4822 122 33777	47pF	5%	63V
2878	4822 126 13883	220pF	5%	50V
2881	4822 124 40769	4,7μF	20%	100V
2882	4822 126 13883	220pF	5%	50V
2885	4822 124 40769	4,7μF	20%	100V
2887	4822 126 14585	100nF	10%	50V
2888	4822 124 80231	47μF	20%	16V
2891	4822 126 14247	1,5nF	10%	50V
2893	4822 122 33575	220pF	5%	50V
2894	3198 017 44740	470nF	20%	10V
2895	4822 126 14305	100nF	10%	16V
2896	4822 126 14305	100nF	10%	16V
2897	4822 126 14305	100nF	10%	16V

**RESISTORS**

3701	4822 051 20479	47Ω	5%	0,1W
3702	4822 051 20479	47Ω	5%	0,1W
3703	4822 051 20479	47Ω	5%	0,1W
3704	4822 117 12917	1Ω	5%	0,06W
3710	4822 051 51831	18kΩ	5%	0,1W
3712	4822 051 30109	10Ω	5%	0,06W
3713	4822 051 30223	22kΩ	5%	0,06W
3714	4822 051 30103	10kΩ	5%	0,06W
3715	4822 117 13632	100kΩ	1%	0,06W
3716	4822 051 30471	470Ω	5%	0,06W
3717	4822 117 12917	1Ω	5%	0,06W
3719	4822 051 30102	1kΩ	5%	0,06W
3720	4822 051 20474	470kΩ	5%	0,1W
3721	4822 051 20393	39kΩ	5%	0,1W
3723	4822 051 30272	2,7kΩ	5%	0,06W
3724	4822 117 12902	8,2kΩ	1%	0,06W
3725	4822 051 30184	180kΩ	5%	0,06W
3730	4822 051 20333	33kΩ	5%	0,1W
3740	4822 051 20223	22kΩ	5%	0,1W
3741	4822 051 20223	22kΩ	5%	0,1W
3742	4822 051 20223	22kΩ	5%	0,1W
3743	4822 051 20223	22kΩ	5%	0,1W
3744	4822 051 30103	10kΩ	5%	0,06W
3746	4822 051 30103	10kΩ	5%	0,06W
3750	4822 051 30102	1kΩ	5%	0,06W
3751	4822 051 30102	1kΩ	5%	0,06W
3789	4822 051 30471	470Ω	5%	0,06W
3790	4822 051 30561	560Ω	5%	0,06W
3791	4822 117 12968	820Ω	5%	0,06W
3792	4822 051 30332	3,3kΩ	5%	0,06W
3793	4822 051 20471	470Ω	5%	0,1W
3794	4822 051 30391	390Ω	5%	0,06W
3795	4822 051 30222	2,2kΩ	5%	0,06W
3796	4822 051 30332	3,3kΩ	5%	0,06W
3798	4822 051 30102	1kΩ	5%	0,06W
3799	4822 051 30102	1kΩ	5%	0,06W
3800	4822 051 51831	18kΩ	5%	0,1W



**ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE**

## RESISTORS

3801	© 4822 051 30103	10kΩ	5%	0,06W
3802	© 4822 051 51831	18kΩ	5%	0,1W
3803	© 4822 117 10833	10kΩ	1%	0,1W
3804	© 4822 051 30103	10kΩ	5%	0,06W
3805	© 4822 051 30103	10kΩ	5%	0,06W
3806	© 4822 051 30103	10kΩ	5%	0,06W
3807	© 4822 051 30103	10kΩ	5%	0,06W
3808	© 4822 051 30103	10kΩ	5%	0,06W
3809	© 4822 051 20471	470Ω	5%	0,1W
3811	© 4822 051 51831	18kΩ	5%	0,1W
3812	4822 053 10228	2,2Ω	5%	1W
3813	© 4822 117 13608	4,7Ω	5%	0,06W
3814	© 4822 051 30339	33Ω	5%	0,06W
3815	4822 052 10478	4,7Ω	5%	NFR
3818	© 4822 051 30222	2,2kΩ	5%	0,06W
3819	© 4822 051 20471	470Ω	5%	0,1W
3820	© 4822 051 30222	2,2kΩ	5%	0,06W
3821	© 4822 051 30222	2,2kΩ	5%	0,06W
3822	© 4822 051 30222	2,2kΩ	5%	0,06W
3825	© 4822 051 20181	180Ω	5%	0,1W
3826	© 4822 051 30333	33kΩ	5%	0,06W
3827	© 4822 051 20273	27kΩ	5%	0,1W
3828	© 4822 051 20223	22kΩ	5%	0,1W
3831	© 4822 051 30101	100Ω	5%	0,06W
3832	© 4822 051 30103	10kΩ	5%	0,06W
3833	© 4822 051 30223	22kΩ	5%	0,06W
3834	© 4822 051 20223	22kΩ	5%	0,1W
3835	4822 052 10478	4,7Ω	5%	NFR
3837	© 4822 051 10102	1kΩ	2%	0,25W
3838	© 4822 051 30102	1kΩ	5%	0,06W
3839	© 4822 051 20124	120kΩ	5%	0,1W
3840	© 4822 051 30124	120kΩ	5%	0,06W
3841	© 4822 117 10833	10kΩ	1%	0,1W
3842	© 4822 117 10833	10kΩ	1%	0,1W
3843	© 4822 117 10834	47kΩ	1%	0,1W
3844	© 4822 051 20392	3,9kΩ	5%	0,1W
3845	© 4822 117 10833	10kΩ	1%	0,1W
3846	© 4822 117 10834	47kΩ	1%	0,1W
3847	© 4822 051 20562	5,6kΩ	5%	0,1W
3849	© 4822 051 20334	330kΩ	5%	0,1W
3850	© 4822 051 30103	10kΩ	5%	0,06W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	© 4822 051 20471	470Ω	5%	0,1W
3858	© 4822 117 12925	47kΩ	1%	0,06W
3859	© 4822 117 10834	47kΩ	1%	0,1W
3860	© 4822 117 10833	10kΩ	1%	0,1W
3861	© 4822 051 30103	10kΩ	5%	0,06W
3862	© 4822 051 20121	120Ω	5%	0,1W
3863	© 4822 117 11373	100Ω	1%	0,1W
3864	© 4822 117 11373	100Ω	1%	0,1W
3865	© 4822 051 30101	100Ω	5%	0,06W
3867	© 4822 051 30121	120Ω	5%	0,06W
3868	© 4822 051 30101	100Ω	5%	0,06W
3870	© 4822 051 20472	4,7kΩ	5%	0,1W
3871	© 4822 051 30103	10kΩ	5%	0,06W
3873	© 4822 051 20471	470Ω	5%	0,1W
3875	© 4822 051 30103	10kΩ	5%	0,06W
3876	© 4822 117 13632	100kΩ	1%	0,06W
3877	© 4822 051 30103	10kΩ	5%	0,06W
3878	© 4822 051 30103	10kΩ	5%	0,06W
3879	© 4822 117 10837	100kΩ	1%	0,1W

## RESISTORS

3880	© 4822 051 30392	3,9kΩ	5%	0,06W
3881	© 4822 117 13632	100kΩ	1%	0,06W
3882	© 4822 117 12925	47kΩ	1%	0,06W
3883	© 4822 117 10833	10kΩ	1%	0,1W
3884	© 4822 051 30271	270Ω	5%	0,06W
3885	© 4822 117 10833	10kΩ	1%	0,1W
3886	© 4822 117 12925	47kΩ	1%	0,06W
3887	© 4822 051 30221	220Ω	5%	0,06W
3888	© 4822 117 10833	10kΩ	1%	0,1W
3889	© 4822 051 20471	470Ω	5%	0,1W
3890	© 4822 051 30102	1kΩ	5%	0,06W
3891	© 4822 051 30102	1kΩ	5%	0,06W
3892	© 4822 051 20471	470Ω	5%	0,1W
3893	© 4822 051 30471	470Ω	5%	0,06W
3894	© 4822 051 30101	100Ω	5%	0,06W
3895	© 4822 117 12971	15Ω	5%	0,06W
3898	© 4822 051 30221	220Ω	5%	0,06W
3899	© 4822 051 30101	100Ω	5%	0,06W
3900	© 4822 117 12955	2,7kΩ	1%	0,1W
3901	© 4822 117 10833	10kΩ	1%	0,1W
3904	© 4822 117 13632	100kΩ	1%	0,06W
4800	© 4822 051 20008			CHIP JUMPER 0805
4801	© 4822 051 20008			CHIP JUMPER 0805
4802	© 4822 051 20008			CHIP JUMPER 0805
4803	© 4822 051 30008			CHIP JUMPER 0603
4804	© 4822 051 20008			CHIP JUMPER 0805
4805	© 4822 051 30008			CHIP JUMPER 0603
4806	© 4822 051 20008			CHIP JUMPER 0805
4807	© 4822 051 20008			CHIP JUMPER 0805
4808	© 4822 051 20008			CHIP JUMPER 0805
4811	© 4822 051 20008			CHIP JUMPER 0805
4814	© 4822 051 20008			CHIP JUMPER 0805
4817	© 4822 051 20008			CHIP JUMPER 0805
4818	© 4822 051 20008			CHIP JUMPER 0805
4819	© 4822 051 20008			CHIP JUMPER 0805
4820	© 4822 051 20008			CHIP JUMPER 0805
4821	© 4822 051 20008			CHIP JUMPER 0805
4822	© 4822 051 20008			CHIP JUMPER 0805
4823	© 4822 051 20008			CHIP JUMPER 0805
4824	© 4822 051 30008			CHIP JUMPER 0603
4825	© 4822 051 30008			CHIP JUMPER 0603
4826	© 4822 051 20008			CHIP JUMPER 0805
4828	© 4822 051 20008			CHIP JUMPER 0805
4829	© 4822 051 20008			CHIP JUMPER 0805
4830	© 4822 051 20008			CHIP JUMPER 0805
4831	© 4822 051 20008			CHIP JUMPER 0805
4832	© 4822 051 30008			CHIP JUMPER 0603
4833	© 4822 051 20008			CHIP JUMPER 0805
4834	© 4822 051 20008			CHIP JUMPER 0805
4835	© 4822 051 20008			CHIP JUMPER 0805
4838	© 4822 051 30008			CHIP JUMPER 0603
4840	© 4822 051 20008			CHIP JUMPER 0805
4841	© 4822 051 30008			CHIP JUMPER 0603
4842	© 4822 051 20008			CHIP JUMPER 0805
4844	© 4822 051 20008			CHIP JUMPER 0805
4845	© 4822 051 20008			CHIP JUMPER 0805
4846	© 4822 051 20008			CHIP JUMPER 0805
4847	© 4822 051 20008			CHIP JUMPER 0805
4848	© 4822 051 20008			CHIP JUMPER 0805
4850	© 4822 051 20008			CHIP JUMPER 0805
4876	© 4822 051 20008			CHIP JUMPER 0805

***ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE*****COILS**


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 1810 4822 242 73557 CERAMIC RES. 8,46MHz
 

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**DIODES**


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 6871 © 4822 130 11397 BAS316  
 6872 © 4822 130 11397 BAS316  
 6873 © 4822 130 11397 BAS316  
 6874 © 4822 130 11397 BAS316  
 6875 © 9340 548 52115 BZX284-C5V1
 

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 6877 © 9322 129 34685 BZX284-C3V9  
 6878 © 4822 130 11397 BAS316  
 6879 © 9322 129 34685 BZX284-C3V9
**TRANSISTORS**


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 7802 © 5322 130 60123 BC807-40  
 7808 © 4822 130 60511 BC847B  
 7809 © 4822 130 60511 BC847B  
 7810 © 4822 130 60511 BC847B  
 7812 © 4822 130 60511 BC847B
 

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 7874 © 4822 130 60511 BC847B  
 7875 © 4822 130 60511 BC847B
**INTEGRATED CIRCUITS**


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 7803 © 5322 209 82941 LM358D, Dual Opamp  
 7805 © 4822 209 33165 TDA1308T/N1  
 7806 4822 209 32852 TDA7073A/N2  
 7807 4822 209 32852 TDA7073A/N2  
 7871 4822 209 32852 TDA7073A/N2
 

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 7873 © 5322 209 11306 HEF4094BT, SHIFT REGISTER  
 7877 © 9352 641 80557 SAA7324H/M2B,"CD10" SIGN.PROC.

# COMBI BOARD

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## ***Brief introduction of the Combi Board***

### A. TRANSFORMER PRIMARY PART

Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

### B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +LED, +12A, +12M, -32V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

### C. SOURCE SELECT & AMPLIFIER PART

#### a) SHIFT REGISTER (AF CONTROL)

This shift register deliver commands from the  $\mu$ P to control the AF functions which include source selection (A0 & A1 control lines), DSC modes, DBB, IS and CD\_STBY. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the  $\mu$ P on the Front board.

#### b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to the selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

#### c) PWM VOLUME CONTROL

The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (ON4986 or selected BC557B) and PWM control signal from  $\mu$ P. For good performance transistors for the left and right channels should be paired for gain characteristics.

#### d) SOUND FEATURES

Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069UBT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

#### e) POWER AMPLIFIER

IC 7391 (AN7125) is used as power amplifier.

#### f) CD\_STBY CONTROL

This Transistor 7401 (BC337-25) switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

#### g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

### D. KARAOKE PART

This simple Karaoke consists of a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

### E. HEADPHONE PART

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

### F. CDC KEY PART

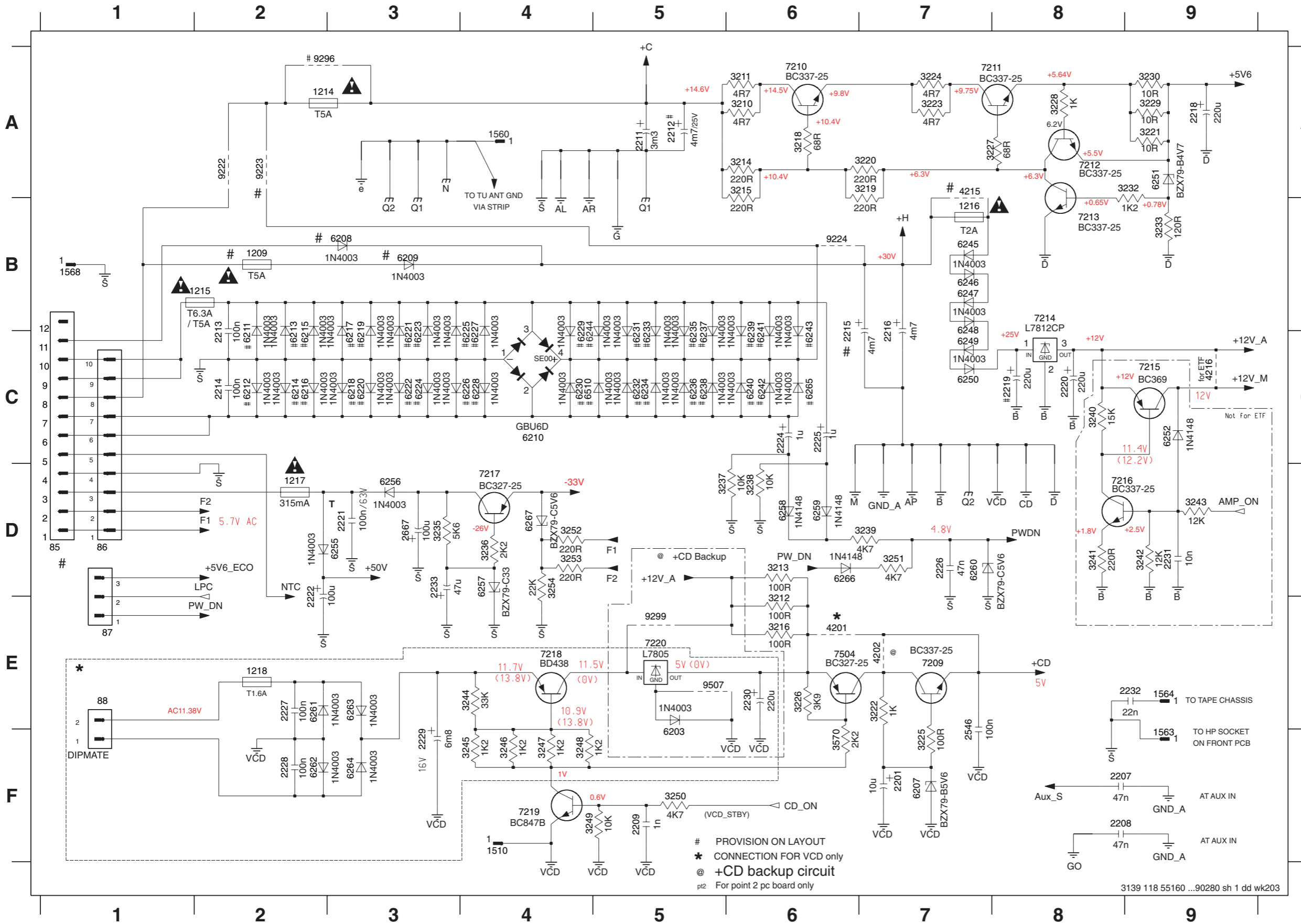
The CDC key buttons and LEDs are provided on this board.







# POWER SUPPLY CIRCUIT



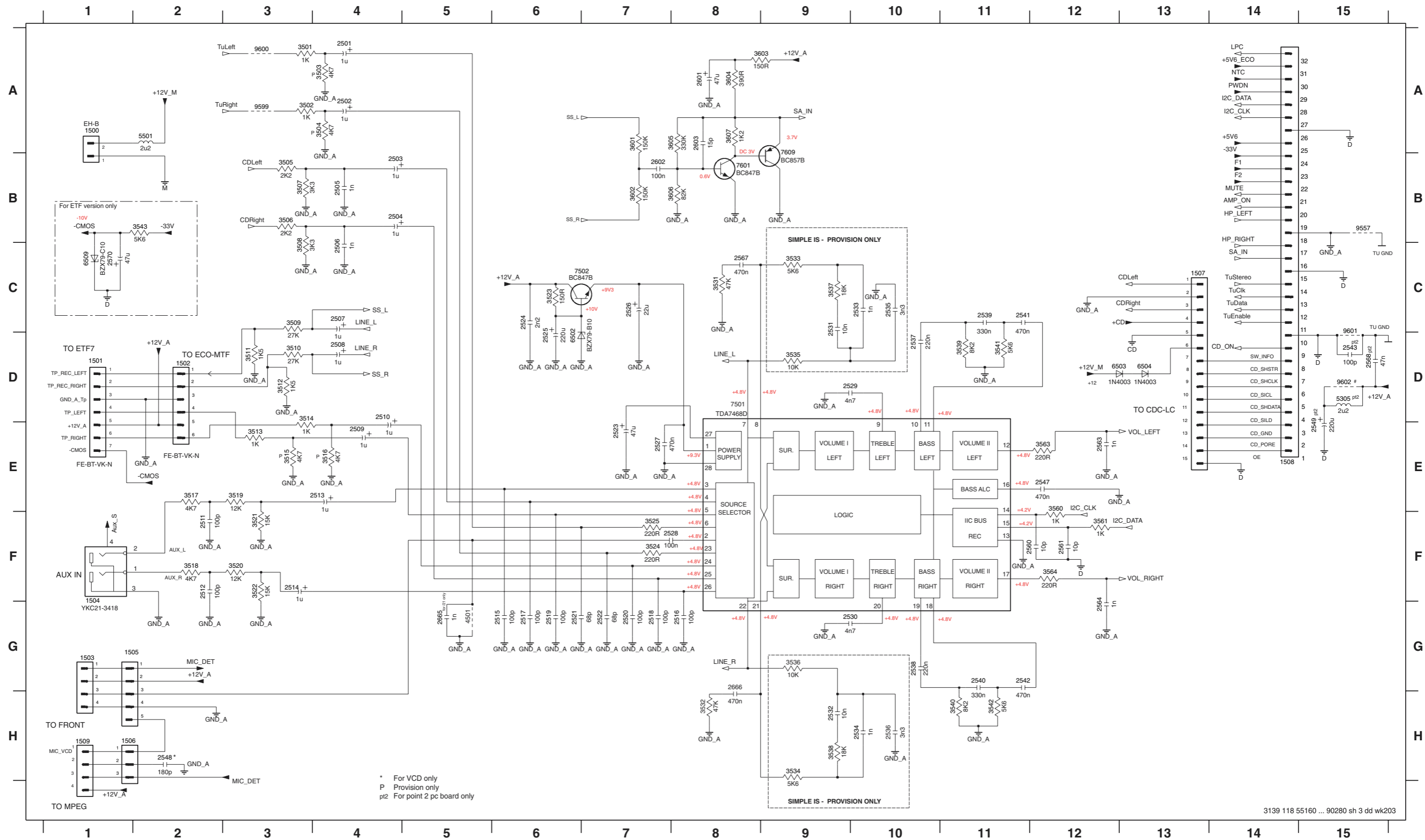
85 D1	3252 D4	9222 A2
86 D1	3253 D4	9223 A2
87 E1	3254 D4	9224 B6
88 E1	3570 F6	9296 A2
1209 B2	4201 E6	9299 E5
1214 A2	4202 E7	9507 E5
1215 B2	4215 A7	
1216 B7	4216 C9	
1217 D2	6203 E5	
1218 E2	6207 F7	
1510 F4	6208 B3	
1560 A4	6209 B3	
1563 F9	6210 C4	
1564 E9	6211 C2	
1568 B1	6212 C2	
2201 F7	6213 C2	
2207 F8	6214 C2	
2208 F8	6215 C2	
2209 F5	6216 C2	
2211 A5	6217 C3	
2212 A5	6218 C3	
2213 C2	6219 C3	
2214 C2	6220 C3	
2215 C6	6221 C3	
2216 C7	6222 C3	
2218 A9	6223 C3	
2219 C8	6224 C3	
2220 C8	6225 C4	
2221 D3	6226 C4	
2222 E2	6227 C4	
2224 C6	6228 C4	
2225 C6	6229 C4	
2226 D7	6230 C4	
2227 E2	6231 C5	
2228 F2	6232 C5	
2229 F3	6233 C5	
2230 E6	6234 C5	
2231 D9	6235 C5	
2232 E9	6236 C5	
	6237 C5	
2233 D3	6238 C5	
2546 F7	6239 C6	
2667 D3	6240 C6	
3210 A6	6241 C6	
3211 A6	6242 C6	
3212 E6	6243 C6	
3213 D6	6244 C4	
3214 A6	6245 B7	
3215 A6	6246 B7	
3216 E6	6247 B7	
3218 A6	6248 B7	
3219 A7	6249 C7	
3220 A7	6250 C7	
3221 A9	6251 A9	
3222 E7	6252 C9	
3223 A7	6255 D3	
3224 A7	6256 D3	
3225 F7	6257 D4	
3226 E6	6258 D6	
3227 A8	6259 D6	
3228 A8	6260 D7	
3229 A9	6261 E2	
3230 A9	6262 F2	
3232 A9	6263 E3	
3233 B9	6264 F3	
3235 D3	6265 C6	
3236 D4	6266 D6	
3237 D5	6267 D4	
3238 D6	6510 C4	
3239 D7	7209 E7	
3240 C8	7210 A6	
3241 D8	7211 A7	
3242 D9	7212 A8	
3243 D9	7213 B8	
3244 E4	7214 B8	
3245 F4	7215 C9	
3246 F4	7216 D8	
3247 F4	7217 D4	
3248 F4	7218 E4	
3249 F4	7219 F4	
3250 F5	7220 E5	
3251 D7	7504 E6	

# PROVISION ON LAYOUT  
 \* CONNECTION FOR VCD only  
 @ +CD backup circuit  
 pl2 For point 2 pc board only



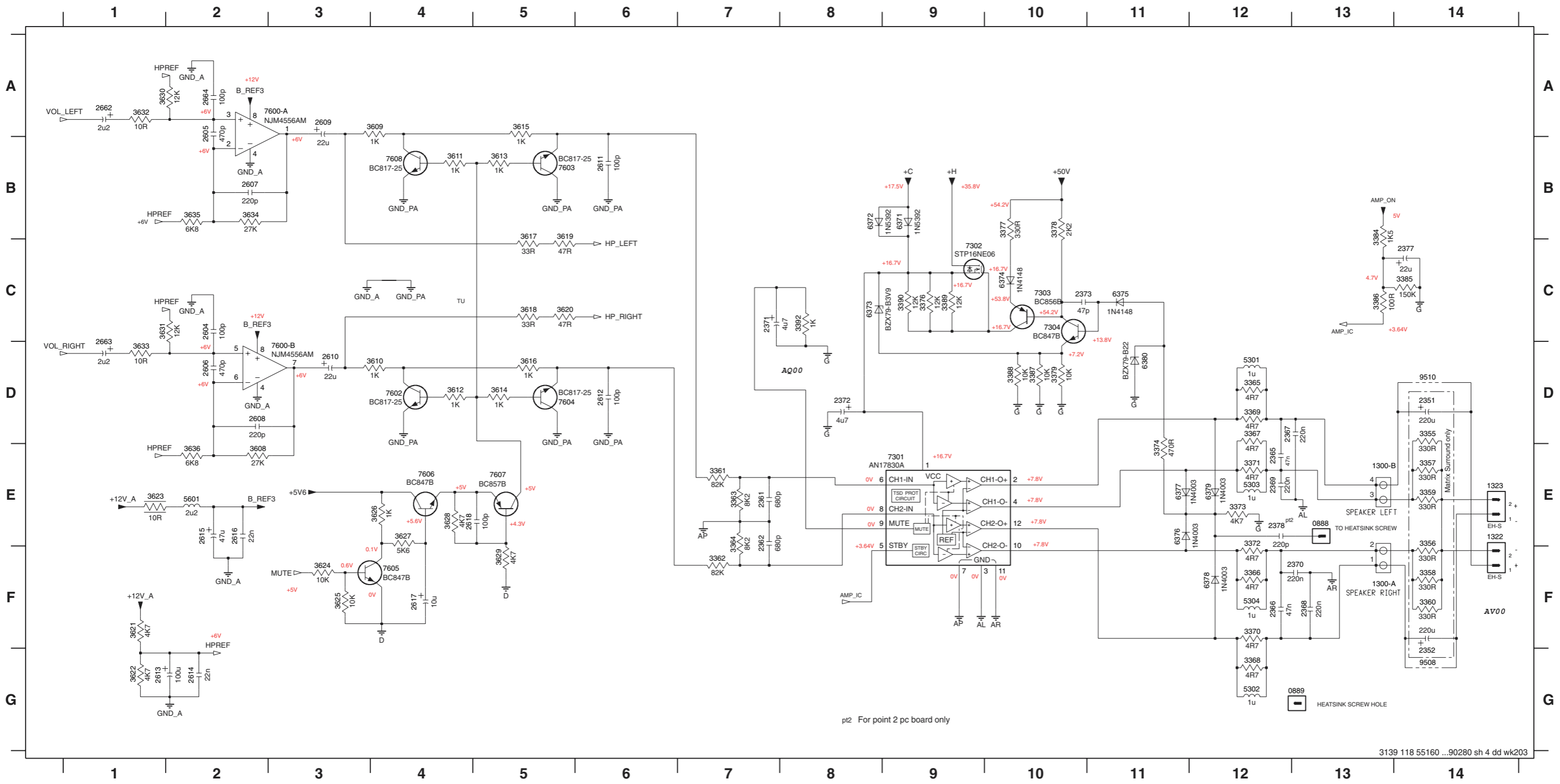
# SOURCE SELECTION CIRCUIT

C3 E15	C10 C14	1501 D1	1507 C13	2504 B4	2510 D4	2516 G8	2522 G7	2528 F7	2534 H10	2540 G11	2549 E15	2568 D15	2665 G5	3505 B3	3511 D3	3517 E2	3523 C6	3534 H9	3540 H11	3563 E12	3605 A8	6502 D6	7601 B8	9602 D15
C4 E15	C11 A3	1502 D2	1508 E14	2505 B4	2511 F2	2517 G6	2523 E7	2529 D9	2535 C10	2541 C11	2560 F12	2570 C1	2666 G8	3506 B3	3512 D3	3518 F2	3524 F7	3535 D9	3541 D11	3564 F12	3606 B8	6503 D12	7609 B9	9603 E15
C5 D15	C13 A3	1503 G1	1509 H1	2506 C4	2512 F2	2518 G7	2524 C6	2530 G9	2536 H10	2542 G11	2561 F12	2571 C1	3501 A3	3507 B3	3513 E3	3519 E3	3525 F7	3536 G9	3542 H11	3601 A7	3607 A8	6504 D13	9557 B15	9603 E15
C6 C15	C14 C15	1504 F1	1501 A4	2507 C4	2513 E4	2519 G6	2525 D6	2531 C9	2537 D10	2543 D15	2562 E12	2601 A8	3502 A3	3508 C3	3514 D3	3520 F3	3531 C8	3537 C9	3543 B2	3602 B7	4501 G5	6509 C1	9599 A3	9600 A3
C7 C15	T_E D14	1505 G2	2502 A4	2508 D4	2514 F3	2520 G7	2526 C7	2532 H9	2538 G10	2547 E12	2564 G12	2602 B7	3503 A4	3509 C3	3515 E3	3521 F3	3532 H8	3538 H9	3540 E12	3603 A9	5305 D15	7501 D8	9600 A3	T_U_LEFT A3
C8 C15	1500 A1	1506 H1	2503 B4	2509 E4	2515 G6	2521 G6	2527 E7	2533 C10	2539 C11	2548 H2	2567 C8	2603 A8	3504 A4	3510 D3	3516 E4	3522 F3	3533 C9	3539 D11	3561 F12	5501 A2	7502 C7	9601 D15	9601 D15	T_U_LEFT A3



# PRE- & POWER AMPLIFIER CIRCUIT

0888 E13	1323 E14	2365 E12	2370 F13	2378 E12	2608 D2	2613 G1	2618 E4	3356 E14	3361 E7	3366 F12	3371 E12	3377 B10	3386 C13	3392 C8	3612 D4	3617 B5	3622 G1	3627 E4	3632 A1	5301 D12	6371 B9	6376 E11	7301 E9	7600-B D3	7606 E4
0889 G13	2351 D14	2366 F12	2371 C7	2604 C2	2609 A3	2614 G2	2662 A1	3357 E14	3362 F7	3367 D12	3372 E12	3378 B10	3387 D10	3608 E2	3613 B5	3618 C5	3623 E1	3628 E4	3633 D1	5302 G12	6372 B8	6377 E11	7302 C9	7602 D4	7607 E5
1300-A F13	2352 F14	2367 D12	2372 D8	2605 A2	2610 D3	2615 E2	2663 D1	3358 F14	3363 E7	3368 G12	3373 E12	3379 D10	3388 D10	3609 A4	3614 D5	3619 B5	3624 F3	3629 F5	3634 B2	5303 E12	6373 C8	6378 F12	7303 C10	7603 B5	7608 B4
1300-B E13	2361 E7	2368 F13	2373 C10	2606 D2	2611 B6	2616 E2	2664 A2	3359 E14	3364 E7	3369 D12	3374 E11	3384 B13	3389 C9	3610 D4	3615 A5	3620 C5	3625 F3	3630 A1	3635 B2	5304 F12	6374 C10	6379 E12	7304 C10	7604 D5	9508 G14
1322 E14	2362 E7	2369 E12	2377 C14	2607 B2	2612 D6	2617 F4	3355 D14	3360 F14	3365 D12	3370 F12	3375 C9	3385 C14	3390 C9	3611 B4	3616 D5	3621 F1	3626 E4	3631 C1	3636 E2	5601 E2	6375 C11	6380 D11	7600-A A2	7605 F4	9510 D14

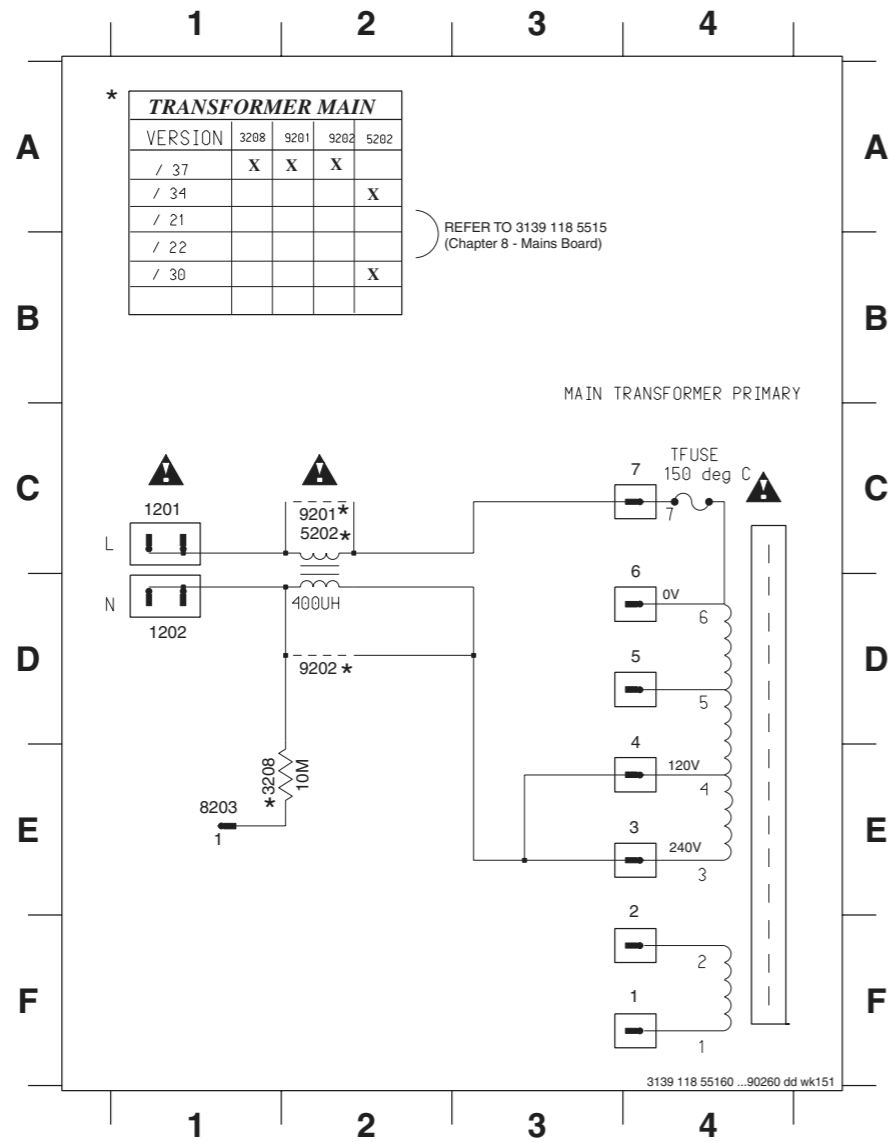


pt2 For point 2 pc board only

3139 118 55160 ...90280 sh 4 dd wk203

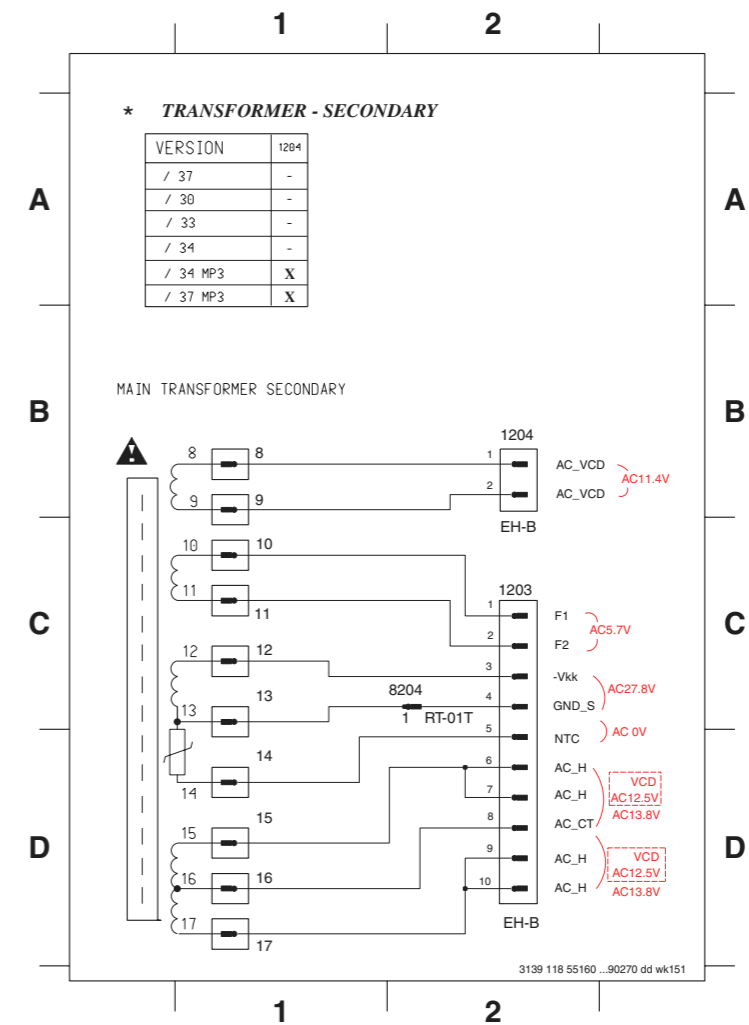
### TRANSFORMER PRIMARY PART - CIRCUIT & LAYOUT (except /21/22 version)

- 1 F4      3 E4      5 D4      7 C4      1202 D1    5202 C2    9201 C2
- 2 E4      4 D4      6 C4      1201 C1    3208 E1    8203 E1    9202 D2

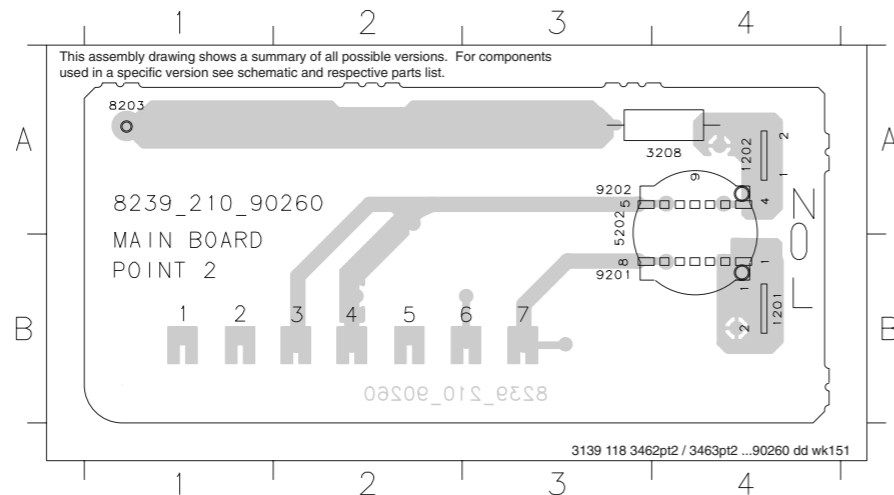


### TRANSFORMER SECONDARY PART - CIRCUIT & LAYOUT (except /21/22 version)

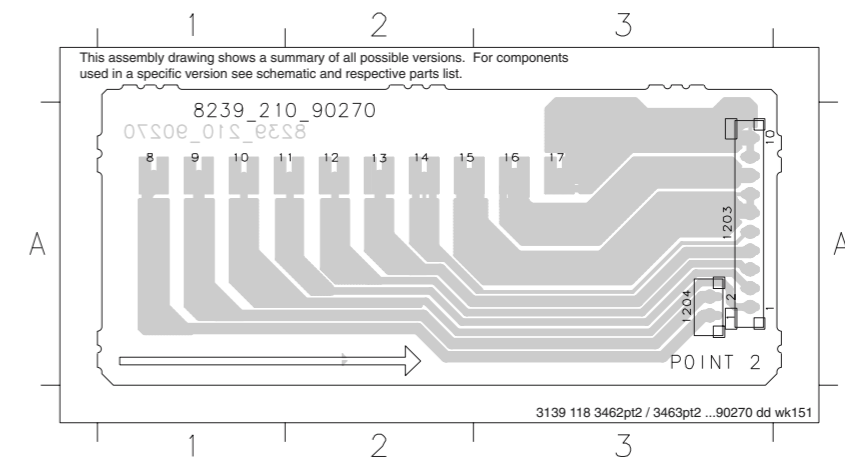
- 8 B1      10 C1    12 C1    14 D1    16 D1    1203 C2    8204 C2
- 9 B1      11 C1    13 C1    15 D1    17 D1    1204 B2



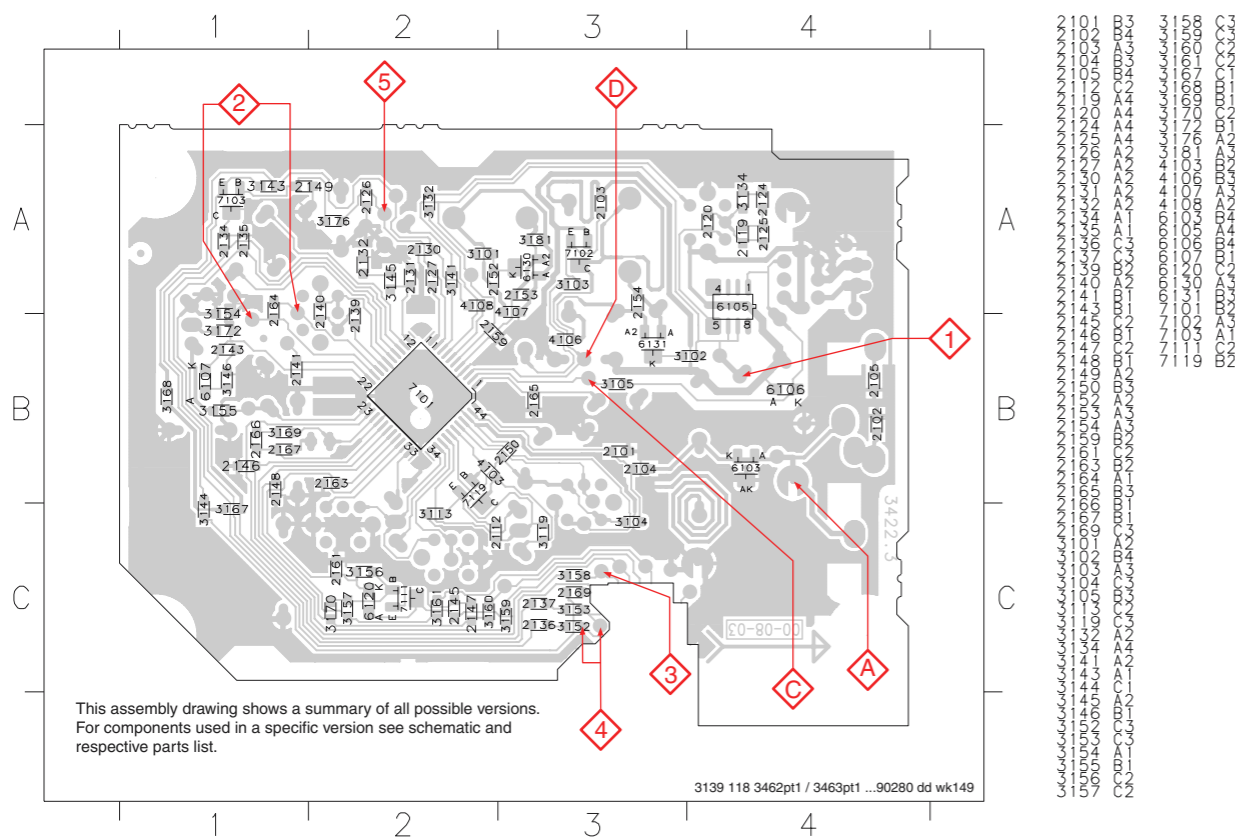
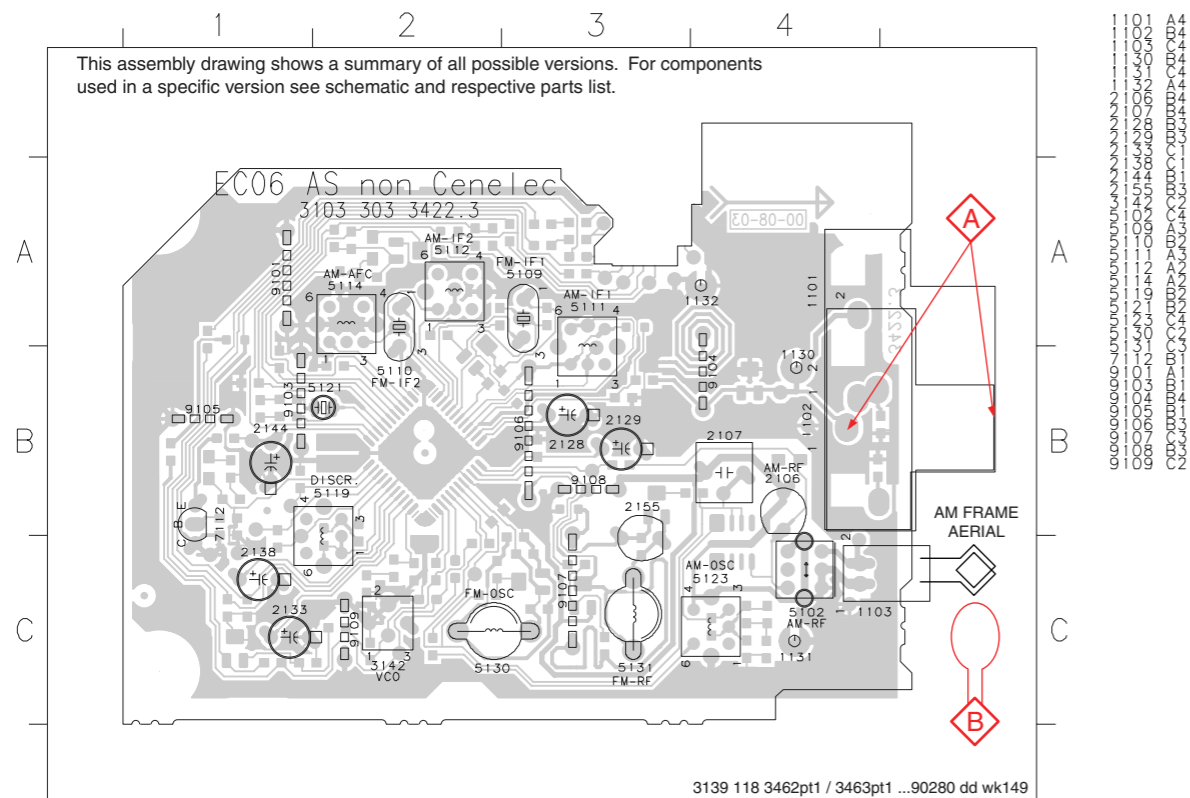
- 1 B1      3 B2      5 B2      1207 B3    1202 A4    5202 A3    9201 B3
- 2 B1      4 B2      6 B3      1201 B4    3208 A4    8203 A1    9202 A3



- 8 A1      10 A1    12 A2    14 A2    16 A3    1203 A3
- 9 A1      11 A1    13 A2    15 A2    17 A3    1204 A3

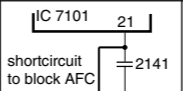
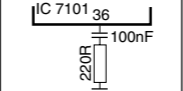
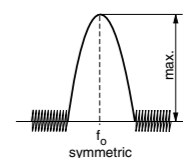
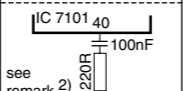

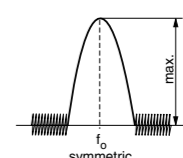


# NON-CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS



Note: This layout drawings are applicable for both pt 1 and pt 2 pc board.

# TUNER ADJUSTMENT TABLE ( ECO6 FM/MW- and FM/MW/LW - versions with AM-frame aerial )

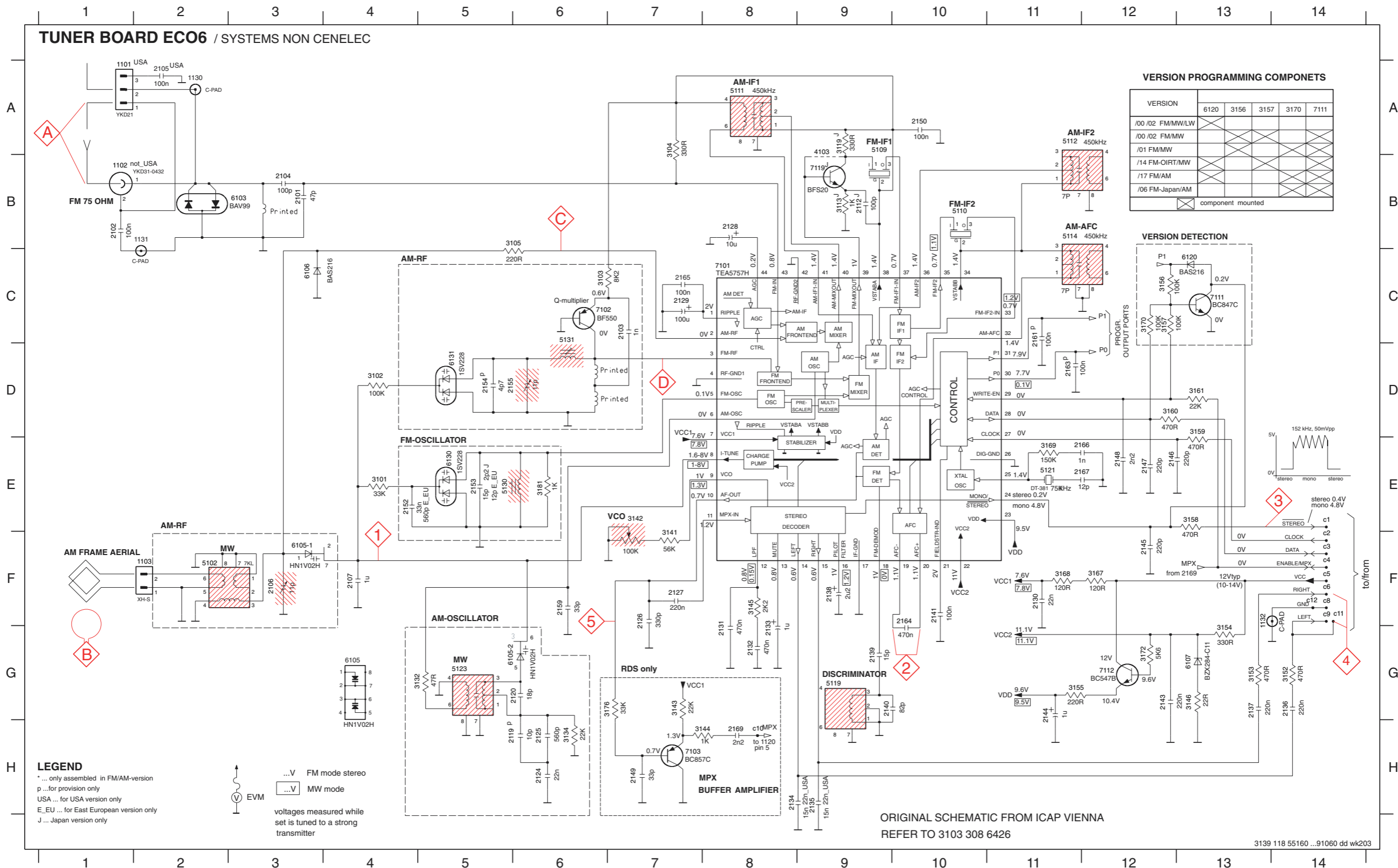
Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz			279kHz	5122	8V ±0.2V	
			153kHz	check	1.1V ±0.4V	
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123	8V ±0.2V	
			531kHz	check	1.1V ±0.4V	
<b>FM IF</b>						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0 ± 3 mV DC
<b>FM RF</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
<b>VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<b>AM IF</b>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C  Δf=±10kHz V <sub>RF</sub> = 0.5mV (as low as possible)		5111	5	
				5112		
<b>AM AFC</b> <b>MW</b>		C  continuous wave V <sub>RF</sub> = 2mV		5114	2	0 ± 2 mV DC
<b>AM RF<sup>3)</sup></b>						
<b>MW<sup>4)</sup></b> FM/MW/LW- and FM/MW-version (9kHz grid)	1494kHz	B  	1494kHz	2106	5	
	531 - 1602kHz		558kHz	5102		
<b>LW</b>	198kHz	198kHz	5103			
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V <sub>RF</sub> as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

- <sup>1)</sup> If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- <sup>2)</sup> RC network serves for damping the IF-filter while adjusting the other one.
- <sup>3)</sup> For AM RF adjustments the original frame antenna has to be used !
- <sup>4)</sup> MW has to be aligned before LW.

↑ Repeat

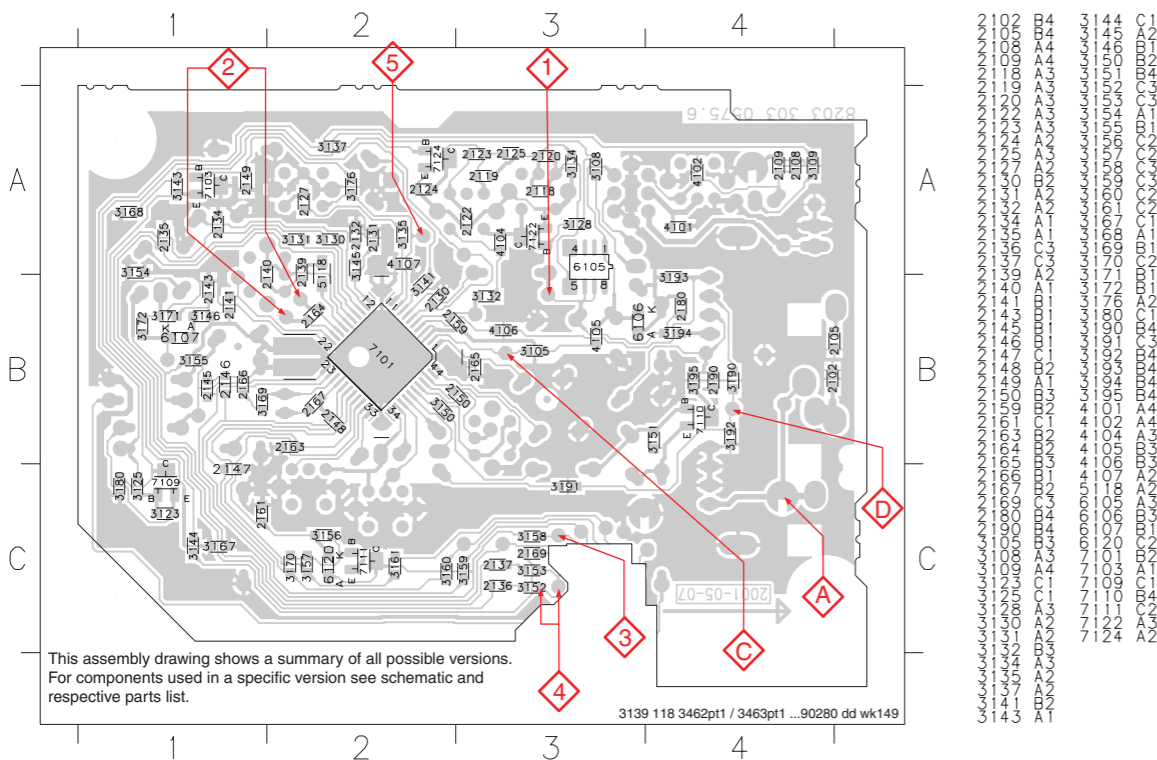
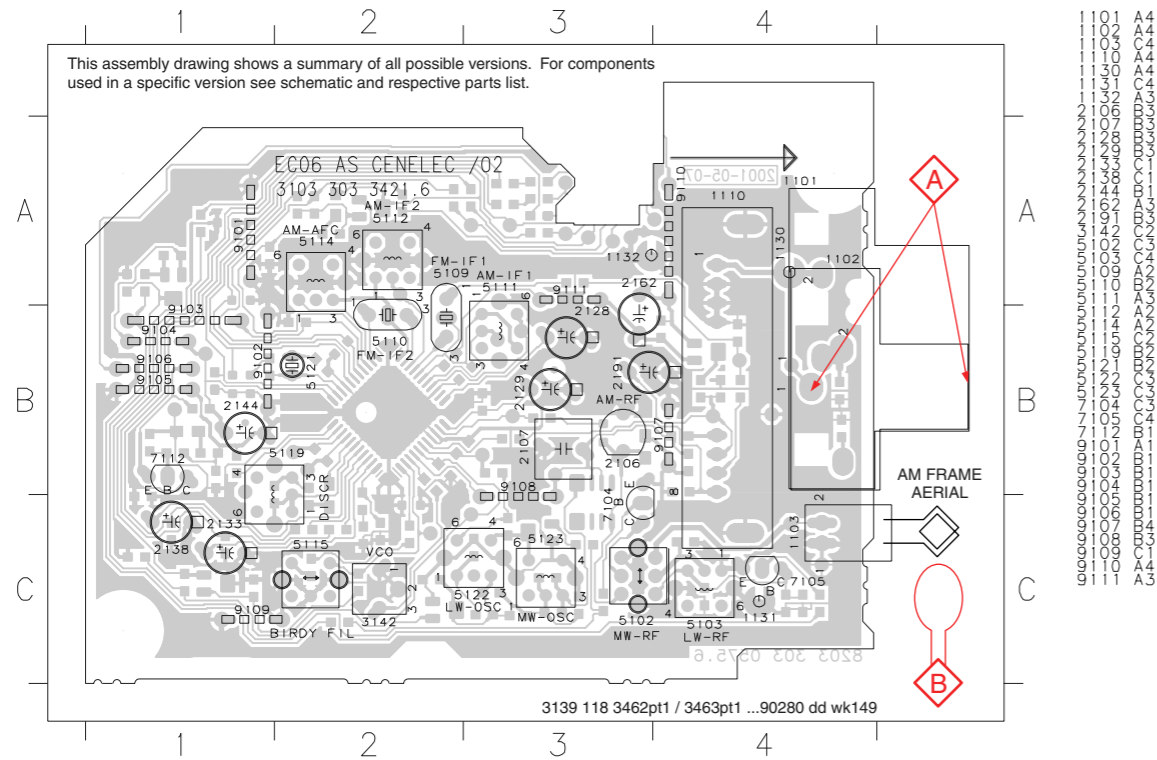
# NON-CENELEC TUNER CIRCUIT



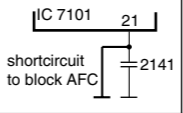
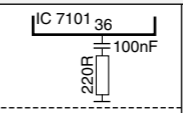
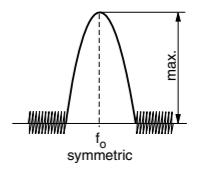
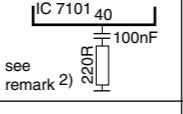
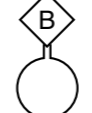
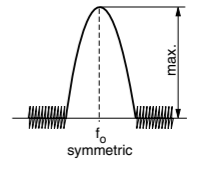
- c1 E14
- c2 F14
- c3 F14
- c4 F14
- c5 F14
- c6 F14
- c8 F14
- c9 F14
- c10 H8
- c11 F14
- c12 F14
- c13 F14
- c14 E14
- c15 G9
- c16 G9
- c17 G9
- c18 G9
- c19 G9
- c20 G9
- c21 G9
- c22 G9
- c23 G9
- c24 G9
- c25 G9
- c26 G9
- c27 G9
- c28 G9
- c29 G9
- c30 G9
- c31 G9
- c32 G9
- c33 G9
- c34 G9
- c35 G9
- c36 G9
- c37 G9
- c38 G9
- c39 G9
- c40 G9
- c41 G9
- c42 G9
- c43 G9
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- c73 G9
- c74 G9
- c75 G9
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- c77 G9
- c78 G9
- c79 G9
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- c81 G9
- c82 G9
- c83 G9
- c84 G9
- c85 G9
- c86 G9
- c87 G9
- c88 G9
- c89 G9
- c90 G9
- c91 G9
- c92 G9
- c93 G9
- c94 G9
- c95 G9
- c96 G9
- c97 G9
- c98 G9
- c99 G9
- c100 G9



# CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS



# TUNER ADJUSTMENT TABLE ( ECO6 Cenelec FM/MW - and FM/MW/LW - versions with AM-frame aerial )

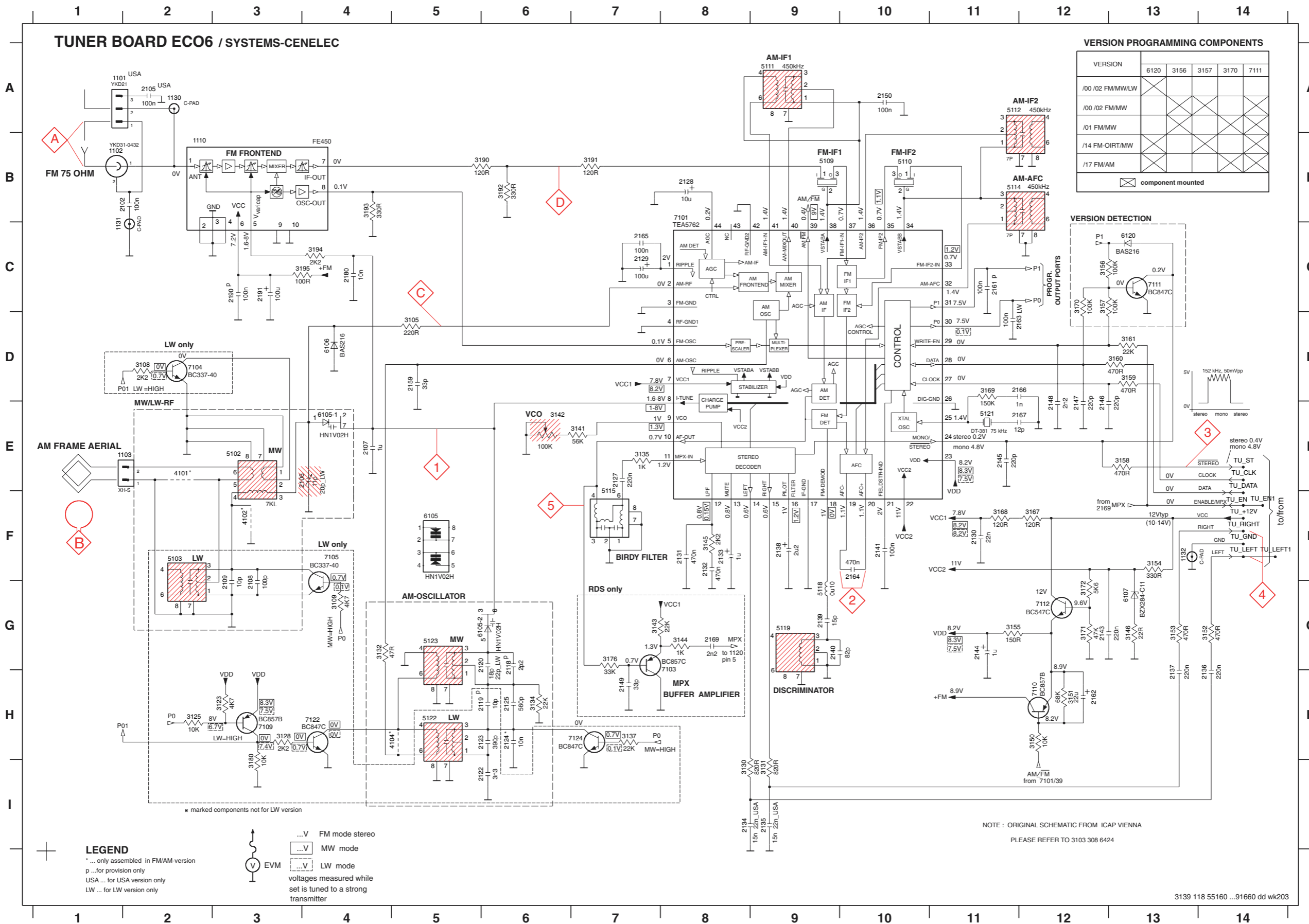
Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (50kHz grid)			108MHz	check		8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
<b>MW</b> 531 - 1602kHz (9kHz grid)			1602kHz	5123	1	8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>FM - IF</b>						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0mV ±3mV
<b>FM - VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<b>FM RF (channel separation)</b> Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.						
<b>FM</b>	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
<b>AM IF</b>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C  $\Delta f = \pm 10\text{kHz}$ $V_{RF} = 0.5\text{mV}$ (as low as possible)		5111	5	
				5112		
<b>AM AFC</b> <b>MW</b>		C  continuous wave $V_{RF} = 2\text{mV}$		5114	2	0mV ±2mV
<b>AM RF<sup>3)</sup></b>						
<b>MW</b>	1494kHz	B 	1494kHz	2106	5	
	558kHz		558kHz	5102		
<b>LW</b>	198kHz	$\Delta f = \pm 30\text{kHz}$ $V_{RF}$ as low as possible	198kHz	5103		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

- 1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- 2) RC network serves for damping the IF-filter while adjusting the other one.
- 3) For AM RF adjustments the original frame antenna has to be used!  
MW has to be aligned before LW.

↑ Repeat

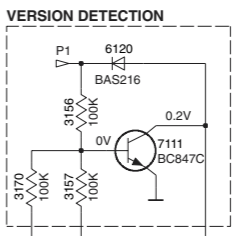
# CENELEC TUNER CIRCUIT



### VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	X	X	X	X	X
/00 /02 FM/MW	X	X	X	X	X
/01 FM/MW	X	X	X	X	X
/14 FM-OIRT/MW	X	X	X	X	X
/17 FM/AM	X	X	X	X	X

component mounted



- AM G13
- FM G13
- 1101 A2
- 1102 B1
- 1103 E2
- 1110 B2
- 1130 A2
- 1131 C1
- 1132 F13
- 2102 B2
- 2105 A2
- 2106 E3
- 2107 E4
- 2108 G3
- 2109 G3
- 2118 G6
- 2119 H6
- 2120 G6
- 2122 H5
- 2123 H6
- 2124 H6
- 2125 H6
- 2127 E7
- 2128 B8
- 2129 C7
- 2130 F11
- 2131 F8
- 2132 F8
- 2133 F8
- 2134 I8
- 2135 I9
- 2136 H14
- 2137 H13
- 2138 F9
- 2139 G9
- 2140 G9
- 2141 F10
- 2143 G12
- 2144 G11
- 2145 E11
- 2146 E12
- 2147 E12
- 2148 E12
- 2149 H7
- 2150 A10
- 2159 D5
- 2161 C11
- 2162 H12
- 2163 D11
- 2164 F10
- 2165 C7
- 2166 D12
- 2167 E12
- 2169 G8
- 2180 C4
- 2190 C3
- 2191 C3
- 3105 D5
- 3108 D2
- 3109 G4
- 3123 H3
- 3125 H2
- 3128 H3
- 3130 I8
- 3131 I9
- 3132 G4
- 3134 H6
- 3135 E7
- 3137 H7
- 3141 E7
- 3142 E6
- 3143 G7
- 3144 G8
- 3146 F8
- 3146 G13
- 3150 H12
- 3152 G14
- 3153 G13
- 3154 F11
- 3155 G11
- 3156 C12
- 3157 C12
- 3158 E13
- 3159 D13
- 3160 D13
- 3161 D13
- 3167 F12
- 3168 F11
- 3169 D11
- 3170 C12
- 3171 G12
- 3172 G12
- 3176 G7
- 3180 I3
- 3190 B6
- 3191 B7
- 3192 B6
- 3193 B4
- 3194 C4
- 3195 C4
- 4101 E2
- 4102 F3
- 4104 H5
- 5102 E3
- 5103 F2
- 5109 B9
- 5110 B10
- 5111 A9
- 5112 A11
- 5114 B11
- 5115 F7
- AM G13
- 5118 G9
- 5119 G9
- 5121 E11
- 5122 H5
- 5123 G5
- 5125 H6
- 5125 H6
- 6105-2 G6
- 6106 D4
- 6107 G13
- 6120 C13
- 7101 B8
- 7103 G8
- 7104 D2
- 7105 F4
- 7109 H3
- 7110 H12
- 7111 C13
- 7112 G12
- 7122 H4
- 7124 H7
- TU\_+12V F14
- TU\_CLK E14
- TU\_DATA E14
- TU\_EN F14
- TU\_GND F14
- TU\_LEFT F14
- TU\_RIGHT F14
- TU\_ST E14





**ELECTRICAL PARTSLIST - COMBI BOARD****- RESISTORS -**

3154	4822 051 30331	330R00 5% 0,062W
3155	4822 051 30221	220R00 5% 0,062W /21M/30/34
3155	4822 051 30151	150R00 5% 0,062W /22
3156	4822 117 13632	100K 1% 0.62W /21M/22/30
3157	4822 117 13632	100K 1% 0.62W /22/34
3158	4822 051 30471	470R00 5% 0,062W
3159	4822 051 30471	470R00 5% 0,062W
3160	4822 051 30471	470R00 5% 0,062W
3161	4822 051 20223	22K00 5% 0,1W /21M/30
3161	4822 051 30223	22K00 5% 0,062W /22/34
3167	4822 051 20121	120R00 5% 0,1W
3168	4822 051 30121	120R00 5% 0,062W
3169	4822 051 30154	150K00 5% 0,062W
3170	4822 117 13632	100K 1% 0.62W /21M/30
3171	4822 117 12925	47K 1% 0.063W /22
3172	4822 051 30562	5K6 5% 0,063W RC21 RST SM
3176	4822 051 30333	33K00 5% 0,062W /22/34
3181	4822 051 30102	1K00 5% 0,062W /21M/30/34
3190	4822 051 30121	120R00 5% 0,062W /22
3191	4822 051 30121	120R00 5% 0,062W /22
3192	4822 051 30331	330R00 5% 0,062W /22
3193	4822 051 30331	330R00 5% 0,062W /22
3194	4822 051 30222	2K20 5% 0,062W /22
3195	4822 051 30101	100R00 5% 0,062W /22
3210	4822 050 24708	4R70 1% 0,6W
3211	4822 050 24708	4R70 1% 0,6W
3212	4822 116 52175	100E 5% 0,5W
3213	4822 116 52175	100E 5% 0,5W
3214	4822 116 83872	220R 5% 0,5W
3215	4822 116 83872	220R 5% 0,5W
3216	4822 116 52175	100E 5% 0,5W
3218	4822 116 52199	68E 5% 0,5W
3219	4822 116 83872	220R 5% 0,5W
3220	4822 116 83872	220R 5% 0,5W
3221	4822 116 52176	10E 5% 0,5W
3222	4822 051 30102	1K00 5% 0,062W
3223	4822 050 24708	4R70 1% 0,6W
3224	4822 050 24708	4R70 1% 0,6W
3225	4822 051 30101	100R00 5% 0,062W
3226	4822 051 30392	3K9 5% 0.063W
3227	4822 116 52199	68E 5% 0,5W
3228	4822 050 11002	1K00 1% 0,4W
3229	4822 116 52176	10E 5% 0,5W
3230	4822 116 52176	10E 5% 0,5W
3232	4822 116 52207	1K2 5% 0,5W
3233	4822 116 52206	120E 5% 0,5W
3235	4822 116 52289	5K6 5% 0,5W
3236	4822 116 52256	2K2 5% 0,5W
3237	4822 050 21003	10K00 1% 0,6W

**- RESISTORS -**

3238	4822 050 21003	10K00 1% 0,6W
3239	4822 116 52283	4K7 5% 0,5W
3249	4822 051 30103	10K00 5% 0,062W
3250	4822 051 30472	4K70 5% 0,062W
3251	4822 116 52283	4K7 5% 0,5W /22/34
3252	4822 116 83872	220R 5% 0,5W
3253	4822 116 83872	220R 5% 0,5W
3254	4822 116 52257	22K 5% 0,5W
3361	4822 117 12864	82K 5% 0,6W
3362	4822 117 12864	82K 5% 0,6W
3363	4822 117 12902	8K2 1% 0.063W
3364	4822 117 12902	8K2 1% 0.063W
3365	4822 117 13608	4,7R 5% 0,0016W
3366	4822 117 13608	4,7R 5% 0,0016W
3367	4822 117 13608	4,7R 5% 0,0016W
3368	4822 117 13608	4,7R 5% 0,0016W
3369	4822 117 13608	4,7R 5% 0,0016W
3370	4822 117 13608	4,7R 5% 0,0016W
3371	4822 117 13608	4,7R 5% 0,0016W
3372	4822 117 13608	4,7R 5% 0,0016W
3373	4822 116 52283	4K7 5% 0,5W
3374	4822 116 83883	470R 5% 0,5W
3376	4822 051 30123	12K00 5% 0,062W
3377	4822 051 30331	330R00 5% 0,062W
3378	4822 051 30222	2K20 5% 0,062W
3379	4822 051 30103	10K00 5% 0,062W
3384	4822 051 30152	1K50 5% 0,062W
3385	4822 051 30154	150K00 5% 0,062W
3386	4822 051 30101	100R00 5% 0,062W
3387	4822 051 30103	10K00 5% 0,062W
3388	4822 051 30103	10K00 5% 0,062W
3389	4822 051 30123	12K00 5% 0,062W
3390	4822 051 30123	12K00 5% 0,062W
3392	4822 051 30102	1K00 5% 0,062W
3501	4822 051 30102	1K00 5% 0,062W
3502	4822 051 30102	1K00 5% 0,062W
3505	4822 051 30222	2K20 5% 0,062W
3506	4822 051 30222	2K20 5% 0,062W
3507	4822 051 30332	3K30 5% 0,062W
3508	4822 051 30332	3K30 5% 0,062W
3509	4822 051 30273	27K00 5% 0,062W
3510	4822 051 30273	27K00 5% 0,062W
3511	4822 051 30152	1K50 5% 0,062W
3512	4822 051 30152	1K50 5% 0,062W
3513	4822 051 30102	1K00 5% 0,062W
3514	4822 051 30102	1K00 5% 0,062W
3517	4822 051 30472	4K70 5% 0,062W
3518	4822 051 30472	4K70 5% 0,062W
3519	4822 051 30123	12K00 5% 0,062W

**ELECTRICAL PARTSLIST - COMBI BOARD****- RESISTORS -**

3520	4822 051 30123	12K00 5% 0,062W
3521	4822 051 30153	15K00 5% 0,062W
3522	4822 051 30153	15K00 5% 0,062W
3523	4822 051 30151	150R00 5% 0,062W
3524	4822 051 30221	220R00 5% 0,062W
3525	4822 051 30221	220R00 5% 0,062W
3531	4822 117 12925	47K 1% 0.063W
3532	4822 117 12925	47K 1% 0.063W
3539	4822 117 12902	47K 1% 0.063W
3540	4822 117 12902	47K 1% 0.063W
3541	4822 051 30562	5K6 5% 0,063W RC21 RST SM
3542	4822 051 30562	5K6 5% 0,063W RC21 RST SM
3543	4822 116 52289	5K6 5% 0,5W
3560	4822 051 30102	1K00 5% 0,062W
3561	4822 051 30102	1K00 5% 0,062W
3563	4822 051 30221	220R00 5% 0,062W
3564	4822 051 30221	220R00 5% 0,062W
3570	4822 051 30222	2K20 5% 0,062W
3601	4822 051 30154	150K00 5% 0,062W
3602	4822 051 30154	150K00 5% 0,062W
3603	4822 051 30151	150R00 5% 0,062W
3604	4822 051 30391	390R00 5% 0,062W
3605	4822 051 30334	330K00 5% 0,062W
3606	4822 117 12864	82K 5% 0,6W
3607	4822 117 11817	1K2 1% 1/16W
3608	4822 051 30273	27K00 5% 0,062W
3609	4822 051 30102	1K00 5% 0,062W
3610	4822 051 30102	1K00 5% 0,062W
3611	4822 051 30102	1K00 5% 0,062W
3612	4822 051 30102	1K00 5% 0,062W
3613	4822 051 30102	1K00 5% 0,062W
3614	4822 051 30102	1K00 5% 0,062W
3615	4822 051 30102	1K00 5% 0,062W
3616	4822 051 30102	1K00 5% 0,062W
3617	4822 051 30339	33R00 5% 0,062W
3618	4822 051 30339	33R00 5% 0,062W
3619	4822 051 30479	47R00 5% 0,062W
3620	4822 051 30479	47R00 5% 0,062W
3621	4822 051 30472	4K70 5% 0,062W
3622	4822 051 30472	4K70 5% 0,062W
3623	4822 052 10109	10R00 5% 0,33W
3624	4822 051 30103	10K00 5% 0,062W
3625	4822 051 30103	10K00 5% 0,062W
3626	4822 051 30102	1K00 5% 0,062W
3627	4822 051 30562	5K6 5% 0,063W RC21 RST SM
3628	4822 051 30472	4K70 5% 0,062W
3629	4822 051 30472	4K70 5% 0,062W
3630	4822 051 30123	12K00 5% 0,062W
3631	4822 051 30123	12K00 5% 0,062W

**- RESISTORS -**

3632	4822 051 30109	10R00 5% 0,062W
3633	4822 051 30109	10R00 5% 0,062W
3634	4822 051 30273	27K00 5% 0,062W
3635	4822 051 30682	6K80 5% 0,062W
3636	4822 051 30682	6K80 5% 0,062W
4101	4822 051 30008	0R00 JUMPER /22
4102	4822 051 30008	0R00 JUMPER /22
4103	4822 051 30008	0R00 JUMPER /21M/30/34
4104	4822 051 30008	0R00 JUMPER /22
4105	4822 051 20008	0R00 JUMP. (0805) /22
4106	4822 051 20008	0R00 JUMP. (0805) /21M/30
4106	4822 051 30008	0R00 JUMPER /22/34
4107	4822 051 30008	0R00 JUMPER /21M/30
4107	4822 051 20008	0R00 JUMP. (0805) /22/34
4108	4822 051 30008	0R00 JUMPER /21M/30/34
4216	4822 051 30008	0R00 JUMPER
4501	4822 051 30008	0R00 JUMPER /22/34
4508	4822 051 30008	0R00 JUMPER
4509	4822 051 30008	0R00 JUMPER
4514	4822 051 30008	0R00 JUMPER
4515	4822 051 30008	0R00 JUMPER
4516	4822 051 30008	0R00 JUMPER
4517	4822 051 30008	0R00 JUMPER
4518	4822 051 30008	0R00 JUMPER
4519	4822 051 30008	0R00 JUMPER
4520	4822 051 30008	0R00 JUMPER
4521	4822 051 30008	0R00 JUMPER
4522	4822 051 30008	0R00 JUMPER
4523	4822 051 30008	0R00 JUMPER
4524	4822 051 30008	0R00 JUMPER
4525	4822 051 30008	0R00 JUMPER
4526	4822 051 30008	0R00 JUMPER
4527	4822 051 30008	0R00 JUMPER
4528	4822 051 30008	0R00 JUMPER
4529	4822 051 30008	0R00 JUMPER
4530	4822 051 30008	0R00 JUMPER
4531	4822 051 30008	0R00 JUMPER
4532	4822 051 30008	0R00 JUMPER
4533	4822 051 30008	0R00 JUMPER
4534	4822 051 30008	0R00 JUMPER
4535	4822 051 30008	0R00 JUMPER
4536	4822 051 30008	0R00 JUMPER
4537	4822 051 30008	0R00 JUMPER
4538	4822 051 30008	0R00 JUMPER
4539	4822 051 30008	0R00 JUMPER
4540	4822 051 30008	0R00 JUMPER
4542	4822 051 30008	0R00 JUMPER
4543	4822 051 30008	0R00 JUMPER
4544	4822 051 30008	0R00 JUMPER

**ELECTRICAL PARTSLIST - COMBI BOARD****- RESISTORS -**

4546	4822 051 30008	OR00 JUMPER
4547	4822 051 30008	OR00 JUMPER
4548	4822 051 30008	OR00 JUMPER
4552	4822 051 30008	OR00 JUMPER
4553	4822 051 30008	OR00 JUMPER
4554	4822 051 30008	OR00 JUMPER
4555	4822 051 30008	OR00 JUMPER
4556	4822 051 30008	OR00 JUMPER
4557	4822 051 30008	OR00 JUMPER
4558	4822 051 30008	OR00 JUMPER
4559	4822 051 30008	OR00 JUMPER
4560	4822 051 30008	OR00 JUMPER
4561	4822 051 30008	OR00 JUMPER
4562	4822 051 30008	OR00 JUMPER
4563	4822 051 30008	OR00 JUMPER
4564	4822 051 30008	OR00 JUMPER
4572	4822 051 30008	OR00 JUMPER
4573	4822 051 30008	OR00 JUMPER
4574	4822 051 30008	OR00 JUMPER
4575	4822 051 30008	OR00 JUMPER
4576	4822 051 30008	OR00 JUMPER
4578	4822 051 30008	OR00 JUMPER
4588	4822 051 30008	OR00 JUMPER

**- COILS & FILTERS -**

5102	4822 157 71634	MW AERIAL
5109	4822 242 70665	SFE10,7MS3-A /21M/30/34
5109	4822 157 71639	SFE10,7MJA10H-A-TF21 /22
5110	4822 242 70665	SFE10,7MS3-A
5111	2422 549 44023	IND VAR 7MM 7PY 450KHZ
5112	4822 157 70302	F7MCS-12216N
5114	4822 157 70302	F7MCS-12216N
5115	4822 157 71636	BIRDIE COIL
5118	3198 018 61070	FXDIND SM 1008 0U10 PM5 /22
5119	4822 157 11443	2U4 10M7
5121	4822 242 10261	T6252F00 (75KHZ)
5123	2422 549 44108	IND VAR 7MM 7PY 796KHZ
5130	4822 157 11843	MD7B-01F /21M/30/34
5131	4822 157 11843	MD7B-01F /21M/30/34
5301	4822 157 62255	COIL 1uH 18,5 TURNS
5302	4822 157 62255	COIL 1uH 18,5 TURNS
5303	4822 157 62255	COIL 1uH 18,5 TURNS
5304	4822 157 62255	COIL 1uH 18,5 TURNS

**- DIODES -**

6103	5322 130 34337	BAV99 /21M/30/34
6105	4822 130 83075	HN1V02H-B
6106	4822 130 11397	BAS316
6107	9340 386 90115	BZX284-C11
6120	9340 255 30135	BAS216 /34
6130	4822 130 82833	1SV228 /21M/30/34
6131	4822 130 82833	1SV228 /21M/30/34
6207	4822 130 83206	BZX79-B5V6
6210	4822 130 10944	GBU6D
6245	4822 130 31878	1N4003G
6246	4822 130 31878	1N4003G
6247	4822 130 31878	1N4003G
6248	4822 130 31878	1N4003G
6249	4822 130 31878	1N4003G
6250	4822 130 31878	1N4003G
6251	4822 130 34174	BZX79-B4V7
6253	4822 130 31878	1N4003G
6254	4822 130 31878	1N4003G
6255	4822 130 31878	1N4003G
6256	4822 130 31878	1N4003G
6257	4822 130 34142	BZX79-B33
6258	4822 130 30621	1N4148
6259	4822 130 30621	1N4148
6260	4822 130 34173	BZX79-C5V6
6266	4822 130 30621	1N4148 /22/34
6267	4822 130 34173	BZX79-C5V6
6371	4822 130 31878	1N4003G
6372	4822 130 31878	1N4003G
6373	3198 010 53980	DIO REG BZX79-B3V9 A COL A
6374	4822 130 30621	1N4148
6375	4822 130 30621	1N4148
6376	4822 130 31878	1N4003G
6377	4822 130 31878	1N4003G
6378	4822 130 31878	1N4003G
6379	4822 130 31878	1N4003G
6380	3198 010 52290	DIO REG BZX79-B22 A COL A
6502	4822 130 61219	BZX79-B10
6503	4822 130 31878	1N4003G
6504	4822 130 31878	1N4003G
6509	4822 130 61219	BZX79-B10

**- IC & TRANSISTORS -**

7101	9351 740 80557	TEA5757H/V1 /21M/30/34
7101	9351 772 20557	TEA5762H/V1 /22
7102	4822 130 42131	BF550 /21M/30/34
7103	5322 130 42756	BC857C /22/34
7110	4822 130 60373	BC856B /22

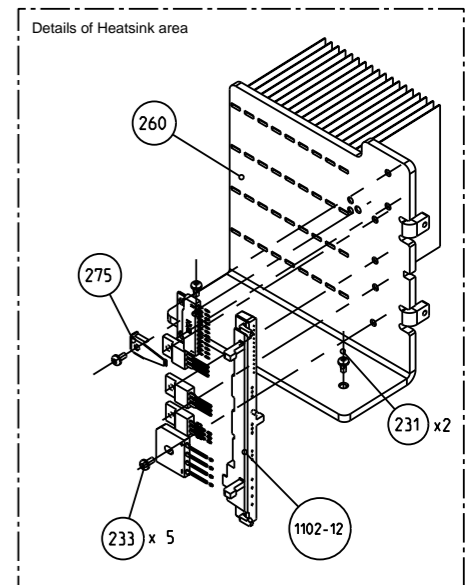
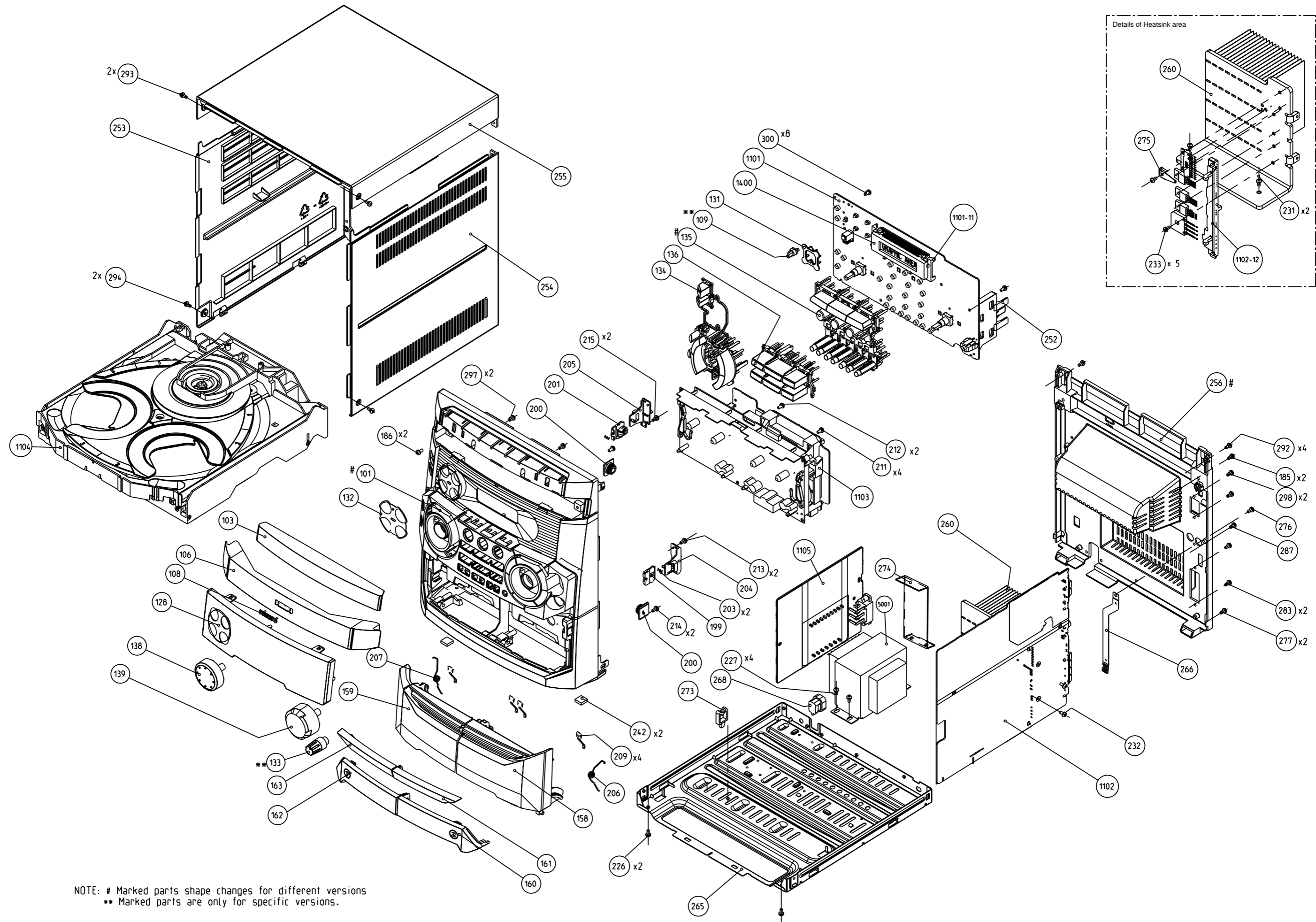
**ELECTRICAL PARTSLIST - COMBI BOARD****- IC & TRANSISTORS -**

7111	5322 130 42755	BC847C
7112	4822 130 40959	BC547B /21M/30/34
7112	4822 130 44503	BC547C /22
7209	4822 130 40981	BC337-25
7210	4822 130 40981	BC337-25
7211	4822 130 40981	BC337-25
7212	4822 130 40981	BC337-25
7213	4822 130 40981	BC337-25
7214	4822 209 33575	L7812CP
7217	4822 130 41246	BC327-25
7219	5322 130 60159	BC846B
7301	9322 174 32682	IC AN17830A (MATJ) B
7302	4822 130 11578	STP16NE06
7303	4822 130 60373	BC856B

**Note: Only these parts mentioned in the list are normal service parts.**



# EXPLODED VIEW - MAIN UNIT



NOTE: # Marked parts shape changes for different versions  
 \*\* Marked parts are only for specific versions.

**MECHANICAL PARTSLIST - MAIN UNIT**

**ACCESSORIES**

**SCREW LISTS - MAIN UNIT**

101	3140 117 64140	CABINET FRONT /21M
101	3140 117 64120	CABINET FRONT /22/34
101	3140 117 66360	CABINET FRONT /30
103	3140 117 64160	COVER CDC PANEL
106	3140 117 64170	COVER TRAY CDC
108	4822 454 13408	BADGE PHILIPS
128	3140 117 64210	WINDOW DISPLAY /21M
128	3140 117 64190	WINDOW DISPLAY /22/34
128	3140 117 66520	WINDOW DISPLAY /30
133	3140 117 65270	KNOB KARAOKE
134	3140 117 64230	BUTTON SET POWER
135	3140 117 65220	BUTTON SET SOURCE /21M/30
135	3140 117 65020	BUTTON SET SOURCE /22/34
136	3140 117 65030	BUTTON SET CONTROL
138	3140 117 64240	KNOB JOG ROT
139	3140 117 64250	KNOB VOL ROT
158	3140 117 64260	COVER CASS RIGHT
159	3140 117 64270	COVER CASS LEFT
160	3140 117 66370	LENS CASS RIGHT
162	3140 117 66380	LENS CASS LEFT
199	4822 402 10621	PUSH-CATCH
200	4822 529 10322	DAMPER ASSY
201	3139 114 68640	PUSH CATCH LEFT
203	4822 492 11344	SPRING COMPRESSION
204	4822 402 11246	BRACKET RIGHT
205	4822 402 11245	BRACKET LEFT
206	3139 111 01380	SPRING TORSION RIGHT
207	3139 111 01390	SPRING TORSION LEFT
209	4822 492 70231	SPRING
242	4822 462 40683	FOOT, RUBBER
253	3139 114 70930	PANEL LEFT
254	3139 114 70940	PANEL RIGHT
255	3139 114 70960	COVER TOP
268	3140 113 21880	MAINS CORD RELIEF
275	4822 492 11735	SPRING TRANS
385	△ 2422 070 98244	MAINS CORD /21M/22/34
385	△ 2422 070 98148	MAINS CORD /30
1400	3139 110 35940	FFC FOIL 30P/180/30P AD /21M/30
1400	3139 110 35930	FFC FOIL 32P/180/32P AD /22 34
1402	4822 320 12703	7P - 140MM
1500	3139 110 35920	FFC FOIL 04P/140/04P AD /21M
1700	4822 320 12654	7P - 220MM
1800	3139 110 35880	FFC FOIL 15P/180/15P BD
5001	△ 3139 118 32610	POWER TRANSFORMER /21M
5001	△ 3139 118 32740	POWER TRANSFORMER /22/30/34

350	3140 118 51230	BOX SPK ASSY FWB-C330/01
351	4822 303 50063	FM AERIAL
356	3139 118 79300	REMOTE CONTROL
384	2422 549 45067	ANT AM LOOP LAN-006 B
387	3140 115 29760	IFU FW-C330 /21M/30
387	3140 115 29740	IFU FW-C330 /22
387	3140 115 29750	IFU FW-C330 /34

185	D3 x 12
186	D3 x 12
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
215	D3 x 12
226	M3 x 6
227	M3 x 6
231	M3 x 10
232	M3 x 10
233	M3 x 10
276	M3 x 6
277	M3 x 10
283	D3 x 12
287	D3 x 12
292	D3 x 12
293	D3 x 12
294	D3 x 10
297	D3 x 12
298	D3 x 12
300	D3 x 12

**Note :** Only the parts mentioned in this list are normal service spare parts.